NCCN GUIDELINES FOR PATIENTS®

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Pancreatic Cancer

Presented with support from:

NCCN FOUNDATION®
Guiding Treatment, Changing Lives.

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Tribute to Debra ("Debbie") Hampton

This book is dedicated in memory of Debra ("Debbie") Hampton, a beloved employee of NCCN. Debbie worked as the Manager of the Oncology Research Program for over 12 years and was passionate and dedicated to the mission of supporting important research to find better treatments for cancer. Those who worked with Debbie know that she would be thrilled to have her legacy include helping others who are going through the difficult diagnosis and treatment for pancreatic cancer. If she could, she would be telling people diagnosed with pancreatic cancer to keep trying and not give up, and to live every day to its fullest as she taught us all to do. May this book help "chart the course" for patients and their caregivers and serve to remind people that researchers everywhere are working fervently to find a cure for this disease.

Pancreatic Cancer

LEARNING that you have cancer can be overwhelming.

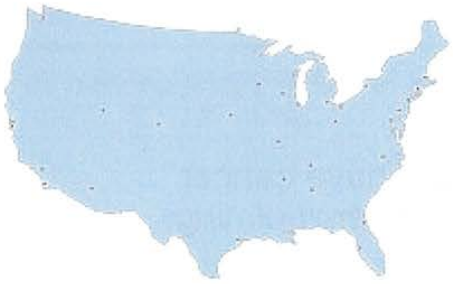
The goal of this book is to help you get the best cancer treatment. It explains which tests and treatments experts in pancreatic cancer recommend.

The National Comprehensive Cancer Network® (NCCN®) is a not-for-profit alliance of 27 of the world's leading cancer centers. Experts from NCCN have written treatment guidelines for doctors who treat pancreatic cancer. These treatment guidelines suggest what the best practice is for cancer care. The information in this patient book is based on the guidelines written for doctors.

This book focuses on the treatment of pancreatic cancer. Key points of the book are summarized in the NCCN Quick Guide™. NCCN also offers patient books on stomach cancer, esophageal cancer, lung cancer, and many other cancer types. Visit NCCN.org/patients for the full library of patient books, summaries, and other resources.

About

National Comprehensive Cancer Network®



These patient guidelines for cancer care are produced by the National Comprehensive Cancer Network® (NCCN®).

The mission of NCCN is to improve cancer care so people can live better lives. At the core of NCCN are the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®). NCCN Guidelines® contain information to help health care workers plan the best cancer care. They list options for cancer care that are most likely to have the best results. The NCCN Guidelines for Patients® present the information from the NCCN Guidelines in an easy-to-learn format.

Panels of experts create the NCCN Guidelines. Most of the experts are from NCCN Member Institutions. Their areas of expertise are diverse. Many panels also include a patient advocate. Recommendations in the NCCN Guidelines are based on clinical trials and the experience of the panelists. The NCCN Guidelines are updated at least once a year. When funded, the patient books are updated to reflect the most recent version of the NCCN Guidelines for doctors.

For more information about the NCCN Guidelines, visit NCCN.org/clinical.asp.

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NCCN FOUNDATION®
Guiding Treatment, Changing Lives.

NCCN Foundation was founded by NCCN to raise funds for patient education based on the NCCN Guidelines. NCCN Foundation offers guidance to people with cancer and their caregivers at every step of their cancer journey. This is done by sharing key information from the world's leading cancer experts. This information can be found in a library of NCCN Guidelines for Patients® and other patient education resources. NCCN Foundation is also committed to advancing cancer treatment by funding the nation's promising doctors at the center of cancer research, education, and progress of cancer therapies.

For more information about NCCN Foundation, visit NCCNFoundation.org.

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How to use this book

Who should read this book?

This book is about treatment for cancer that starts in the ducts of the pancreas, called ductal adenocarcinoma. The information in this book may help patients and those who support them like caregivers, family, and friends.

Where should you start reading?

Starting with Part 1 may be helpful. It explains what pancreatic cancer is and how this cancer is diagnosed. Part 2 shares health tests, other care needed to plan treatment, and the stages of pancreatic cancer. Part 3 gives an overview of treatment options for pancreatic cancer, followed by supportive care in Part 4. Part 5 has treatment guides you can follow along with your doctor. Lastly, in Part 6 you will find questions for your doctors and helpful resources.

Does the whole book apply to you?

This book includes information for many situations. Your treatment team can help. They can point out what information applies to you. They can also give you more information. As you read through this book, you may find it helpful to make a list of questions to ask your doctors.

The recommendations in this book are based on science and the experience of NCCN experts. However, these recommendations may not be right for your situation. Your doctors may suggest other tests and treatments based on your health and other factors. If other recommendations are given, feel free to ask your treatment team questions.

Help! What do the words mean?

In this book, many medical words are included. These are words you will likely hear from your treatment team. Most of these words may be new to you, and it may be a lot to learn.

Don't be discouraged as you read. Keep reading and review the information. Feel free to ask your treatment team to explain a word or phrase that you don't understand.

Words that you may not know are defined in the text or in the *Dictionary*. Acronyms are also defined when first used and in the *Glossary*. One example is CT for **c**omputed **t**omography.

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About pancreatic cancer

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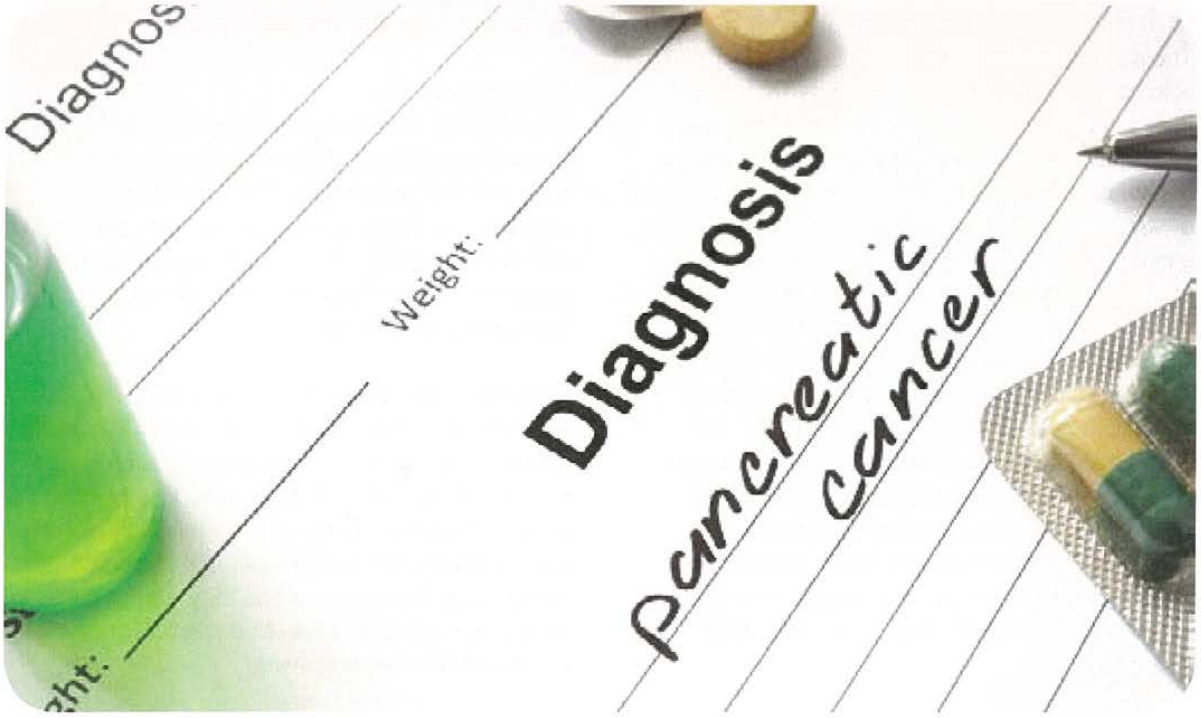


Learning that you or a loved one has cancer can be overwhelming. Part 1 reviews some basics about pancreatic cancer that may help you better understand this disease. This information may also help you start planning for treatment.

The pancreas

The pancreas is a gland found behind the stomach. A gland is an organ that makes fluids or chemicals the body needs. The pancreas is about 6 inches long and has 3 main parts:

- The widest part is called the head.
- The middle part is called the body.
- The narrow end is called the tail.

The pancreas makes hormones, such as insulin. It also makes proteins, called enzymes, that help to digest food. Endocrine cells of the pancreas make hormones. Enzymes are made by exocrine cells in the small ducts of the pancreas. Ducts are tiny tubes or vessels that fluids pass through. The small ducts connect to the main pancreatic duct that extends from the tail to the head of the pancreas.

The liver is near the pancreas, above the gallbladder. The liver removes waste from blood and makes bile. Bile is a fluid that helps to digest food. The gallbladder stores bile from the liver. The common bile duct carries bile from the liver into the main pancreatic duct. From the main pancreatic duct, bile and enzymes empty into the duodenum. The duodenum is the first part of the small intestine, which absorbs nutrients from eaten food. **See Figure 1.**

Cancer basics

Cancer is a disease of cells—the building blocks that form tissue in the body. Normal cells grow and then divide to make new cells. New cells are made as the body needs them. When normal cells grow old or get damaged, they die. Cancer cells don't do this. Cancer cells make new cells that aren't needed and don't die quickly when old or damaged. **See Figure 2.** Over time, cancer cells grow and divide enough to form a primary tumor. Primary tumors can grow large and invade nearby tissues. Primary tumors can also send cancer cells to other areas in the body to form metastases.

Genes are the codes within the cell that carry the instructions for making new cells. They also control how cells behave. Changes in genes turn normal cells into cancer cells. Within the pancreas, exocrine or endocrine cells can become cancer cells. About 90 out of 100 pancreatic cancers start in exocrine cells that line the ducts of the pancreas. This type of pancreatic cancer is called ductal adenocarcinoma and is the focus of this patient book.

Risk factors

Anything that increases your chances of cancer is called a risk factor. Certain risk factors can be seen with this cancer type. Risk factors can be activities that people do, things you have contact with in the environment, or traits passed down from parents to children through genes. Genes are coded instructions for your cells.

A process called mutation is when something goes wrong in the genetic code. Mutations can be passed on from a parent and may be present before you are born (inherited), or may be caused later in life by genetic damage (acquired). People with inherited genetic mutations have a higher risk for certain cancers, but that doesn't mean they will definitely develop cancer. Only a small number of cancers are a result of inherited mutations.

Figure 1
Pancreas and nearby organs

The pancreas is a gland found behind the stomach. The liver is near the pancreas, above the gallbladder. The duodenum is the first part of the small intestine.

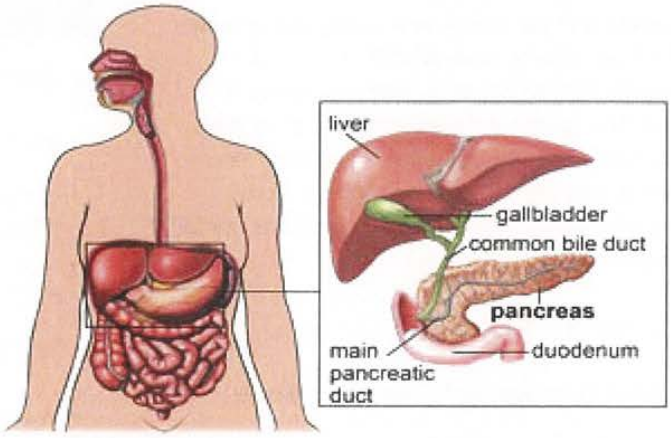
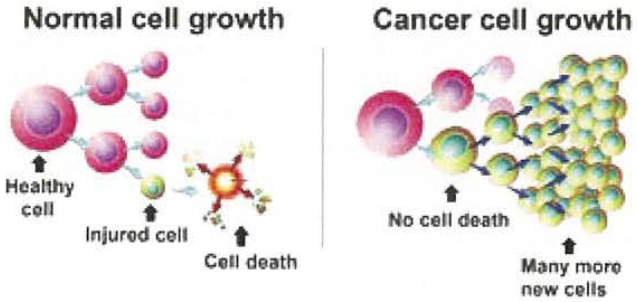


Figure 2
Normal cell growth vs. cancer cell growth

Normal cells increase in number when they are needed and die when old or damaged. In contrast, cancer cells quickly make new cells and live longer because of abnormal changes in genes.



Pancreatic cancer

Genetic testing is recommended for people diagnosed with pancreatic at a young age (younger than 50 years), who have a family history of pancreatic cancer, or are of Ashkenazi Jewish decent. This testing will help doctors learn if there is an inherited genetic mutation. If so, other family members may consider genetic testing. Some cancer-related syndromes that increase the risk for pancreatic cancer include:

- Peutz-Jeghers syndrome
- Melanoma-pancreatic cancer syndrome
- Lynch syndrome
- Hereditary breast-ovarian cancer syndrome
- Familial pancreatic cancer and pancreatitis

These syndromes may also put someone at risk for other types of cancer. Share what you know about your family history with your doctor. Ask questions about your risk for cancer.

Having more than one first-degree relative (parent, brother, sister, or child) with pancreatic cancer increases your risk. About 10 out of 100 people diagnosed with pancreatic cancer have some family history of this cancer. When it comes to new patients, NCCN experts recommend that doctors discuss family history of cancer. For someone with pancreatic cancer, this includes talking about a personal or family history of melanoma, pancreatic, colon, rectum, breast, and/or ovarian cancer.

Guide 1. Risk Factors

Risk Factors
• Tobacco smoking
• Alcohol use
• Contact with certain chemicals and heavy metals (eg, pesticides and asbestos)
• High BMI (**b**ody **m**ass **i**ndex – body fat and height)
• Diet (eg, eating a lot of red or processed meats)
• History of diabetes
• Chronic pancreatitis
• Family history of pancreatic cancer

Doctors are not completely sure what causes pancreatic cancer, but there are some risk factors to be aware of for this cancer. Some of the risk factors in Guide 1 carry a low risk for development of pancreatic cancer. For example, smoking is a known risk factor that increases the chance for pancreatic cancer to a small degree. Scientific data (from clinical trials) may show a link to cancer, but may not be clear or enough to make it a known risk factor. Thus, doctors continue to study the cause of pancreatic cancer.

It is helpful to ask your doctor or nurse to explain the risk factors for pancreatic cancer that might apply to you. He or she will consider your lifestyle, health history, and your family's health history.

Symptoms

Doctors need to assess your health and learn about your symptoms. Keep in mind, symptoms of pancreatic cancer (such as abdominal discomfort) can overlap with many other medical conditions. Some people with pancreatic cancer may have one symptom or many at one time. Early on, pancreatic cancer may not show any signs or symptoms at all. See Guide 2 for a list of possible symptoms.

Guide 2. Symptoms

Symptoms
• Weight loss
• Jaundice (yellowing of the skin and eyes)
• Nausea
• Floating stools
• Pain in the belly (abdomen) or back
• Indigestion (eg, heartburn, pain, fullness in belly)
• Depression

Your doctor may think you have this cancer when he or she finds something abnormal on a routine blood test, or there are signs of cancer on a routine imaging test. He or she will also consider any symptoms you share that could be caused by pancreatic cancer.

Doctors may consider screening for people at high-risk for pancreatic cancer. People considered at high risk include those with a family history or known inherited genetic mutation for pancreatic cancer. Screening is when tests are done on a regular basis to detect a disease in someone without symptoms. Currently, there is no general screening test for pancreatic cancer.

It is important to tell the doctor how you are feeling during your visit or call if you have any symptoms. If you are having symptoms, ask what tests you will have and why they are being done. If your doctor suspects pancreatic cancer, he or she may order tests to get more information about your health. This may include blood tests and imaging tests. Find out more about testing for pancreatic cancer in Part 2.

Unlike normal cells, cancer cells can spread and form tumors in other parts of the body. The spread of cancer makes it dangerous. Cancer cells can invade normal tissue and cause organs to stop working. Cancer that has spread is called a metastasis.

- Cancer that has spread to a nearby body part is called a local metastasis.
- Cancer that has spread to a body part far from the primary tumor is called a distant metastasis.

Cancer can spread to distant sites through blood. Two major blood vessels lie behind the pancreas. The superior mesenteric artery supplies the intestines with blood. The superior mesenteric vein returns blood to the heart.

Cancer can also spread through the lymphatic system. The lymphatic system has a clear fluid called lymph. Lymph gives cells water and food. It also has white blood cells that fight germs. Lymph nodes filter lymph and remove the germs. Lymph travels throughout the body in vessels like blood does. Lymph vessels and nodes are found everywhere in the body. **See Figure 3.**

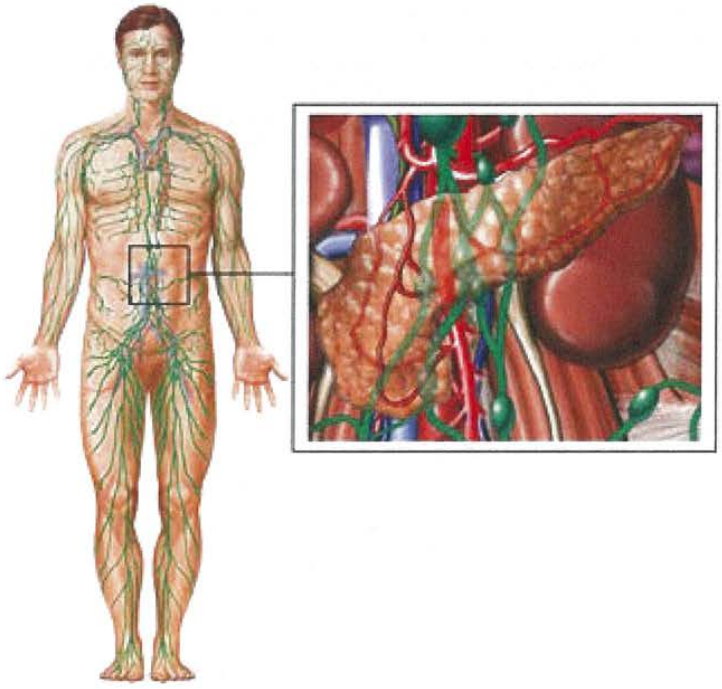


Figure 3
Lymph nodes and vessels

Lymph vessels and nodes are found everywhere in the body.

Review

- The pancreas helps digest food.
- Anything that increases your chances of cancer is called a risk factor.
- Doctors need to assess your health and learn about your symptoms.
- Pancreatic cancer often starts in the cells that line the ducts.
- Cancer cells form a tumor since they don't die as they should.
- Cancer cells can spread to other body parts through blood or lymph.

2
Treatment planning

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13 Medical history and physical exam

14 Imaging tests

18 Blood tests

18 Tissue tests

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20 Review

Treatment planning starts with testing. This section describes the tests that are used to confirm (diagnose) pancreatic cancer and plan treatment. This information can help you know what to expect during testing.

Treatment team

Treating pancreatic cancer takes a team approach. NCCN recommends that treatment decisions involve a multidisciplinary team. This includes doctors and other professionals who are experts in different areas of health care.

- A medical oncologist is a doctor who's an expert in treating cancer with drugs.
- A surgeon is an expert in operations to remove or repair a part of the body.
- A radiation oncologist is an expert at treating cancer with radiation.
- A pathologist is an expert in testing cells and tissue to find disease.
- A gastroenterologist is an expert in diseases of the digestive system (where food is broken down for the body to use).

Besides doctors, you may receive care from nurses, social workers, a registered dietitian, and other health experts. Ask to have the names and contact information of your health care providers included in the treatment plan.

Your treatment team will come together and decide on a treatment plan. This treatment plan will be based on the extent of cancer in your body and your other health needs, as well as your personal choices. A treatment plan is a written course of action that covers every stage of the treatment process.

Once pancreatic cancer is confirmed, your doctors will need to know the stage of the cancer. The cancer stage is a rating by your doctors of how far the cancer has grown and spread. The cancer stage is based on the results of certain tests. It is used to plan which treatments are best for you.

Medical history and physical exam

Two basic tools of diagnosis are when your doctor takes your medical history and does an exam of your body. Your doctor will ask about your medical history, which should include everything that has ever happened to you, related to your health.

Your doctor will ask you about:

- Health events in your life including surgeries, accidents, and past illnesses
- Recent sickness
- Medications you are taking now (It is helpful to keep a list of your meds. Include any supplements and over-the-counter medicine you take.)
- Family history of disease such as cancer, heart disease, or diabetes
- Tobacco, alcohol, or drug use

When the doctor checks your body for signs of disease, it is called a physical exam. Doctors often perform a physical exam along with taking a medical history.

Your doctor will check your:

- Eyes, ears, nose, and throat
- Lungs, heart, and belly (abdomen)
- Body by feeling and using pressure to see if organs are of normal size, soft or hard, or cause pain when touched

Your doctor will also check for jaundice. Jaundice is a yellowing of the skin and eyes due to a buildup of bilirubin in the body. Bilirubin is a yellow-brown substance in bile. Bile is a chemical made by the liver that flows through bile ducts in the liver into the intestines to help digest food. A tumor in the pancreas can cause jaundice by blocking the main bile duct.

Imaging tests

Imaging tests allow your doctors to see inside your body. The images may show if there is a tumor in your pancreas as well as the tumor size and location. Imaging tests are often easy to undergo. There is more than one type of imaging test for pancreatic cancer. Pictures (images) can be made with scanning machines or scoping tools.

Scans/Imaging scans

Scanning machines are large and have a tunnel in the middle. Before the test, you may be asked to stop eating or drinking for several hours. You also should remove any metal objects that are on your body. During the test, you will need to lie on a table that moves slowly through the tunnel. Pillows or straps may be used to keep you still during the test. You will be alone, but a technician will operate the machine in a nearby room. He or she will be able to see, hear, and speak with you at all times.

As the machine takes pictures, you may hear buzzing, clicking, or whirring sounds. A computer combines all pictures into one detailed picture. An imaging scan can take about 30 to 60 minutes to complete.

Often, there are no side effects. If radiation is used, the amount is small. You will likely be able to resume your activities right away unless you were given a sedative. The test results may not be ready for a few days since a radiologist needs to see the pictures. There is more than one type of imaging scan that may be used for pancreatic cancer. The types of imaging scans recommended for pancreatic cancer are described next.

CT (computed tomography) scan

A CT scan is often the first test given for pancreatic cancer. A CT scan takes many pictures of a body part from different angles using x-rays. **See Figure 4.**

A special type of CT scan, called a pancreatic protocol CT scan, is recommended for pancreatic cancer. A protocol is a detailed plan of a medical study, treatment, or procedure. A pancreatic protocol CT is done in a certain way so that all of the pictures focus on the pancreas and nearby area. This special CT scan allows doctors to clearly see the pancreas, nearby blood vessels, and very small tumors.

Before the CT scan, you may be given a contrast dye to make the pictures clearer. The dye will be injected into your vein. It may cause you to feel flushed or get hives. Rarely, serious allergic reactions occur. Tell your doctor if you have had bad reactions before.

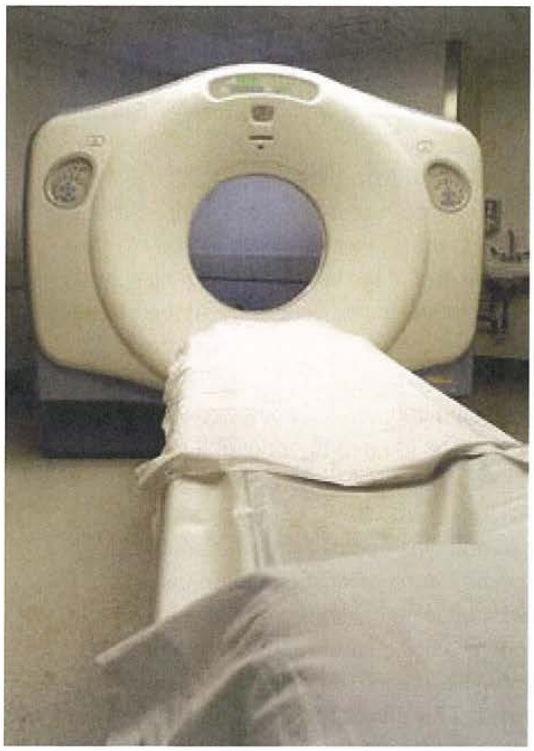


Figure 4
CT scan machine

A CT machine is large and has a tunnel in the middle. During the test, you will lie on a table that moves slowly through the tunnel.

MRI (magnetic resonance imaging) scan
An MRI scan uses radio waves and powerful magnets to take pictures of the inside of the body. It does not use x-rays. An MRI may cause your body to feel a bit warm. Like a CT scan, a contrast dye may be used to make the pictures clearer. A special type of MRI scan, called a pancreatic protocol MRI scan, is recommended for pancreatic cancer. A pancreatic protocol MRI scan is done in a certain way so that it focuses on the pancreas and nearby areas. This special MRI scan allows doctors to clearly see the pancreas, nearby blood vessels, and very small tumors. For some people, a pancreatic protocol MRI scan may be used instead of CT to view the pancreas.

MRCP (magnetic resonance cholangiopancreatography)
An MRCP is a type of MRI scan that makes very clear pictures of the pancreas and bile ducts. No contrast dye is used because bile and other fluids serve as contrast. An MRCP takes about 10 minutes, but it is often done along with a normal MRI scan.

Scopes/Internal imaging

Some imaging tests use a thin, tube-shaped tool called a scope that is inserted into the body to take pictures. One end of the scope has a small light and camera lens to see inside your body. At the other end of the scope is an eyepiece that your doctor looks through to see the images shown by the camera. The scope is guided into the body through a natural opening, such as the mouth or nose. It may also be inserted through a small surgical cut.

More than one type of scope may be used for imaging tests. The type of scope often used for pancreatic cancer is called an endoscope. An endoscope is often guided into the body through the mouth. The types of imaging tests with scopes recommended for pancreatic cancer are described below.

EUS (endoscopic ultrasound)
An EUS uses an endoscope that has a small ultrasound probe at the end. The endoscope is inserted through your mouth and guided down your throat and stomach to the first part of the small intestine (duodenum). The ultrasound probe bounces sound waves off your pancreas and other organs to make pictures of the inside of your body. EUS is often done to get a close look at your pancreas and any tumor that might be in it. Sometimes an EUS can detect small lesions (abnormal areas) in the pancreas that are difficult to see on CT or MRI. An FNA (**f**ine-**n**eedle **a**spiration) or needle biopsy can be performed during EUS if any abnormalities are seen.

An EUS takes about 15 to 45 minutes. For this test, your doctor will first give you a sedative. A sedative is medicine that will make you feel relaxed or sleepy. After the test, your throat may feel sore and you may feel bloated.

Your medical records:

✓ Your doctors will order tests and schedule visits to talk about your care plan.

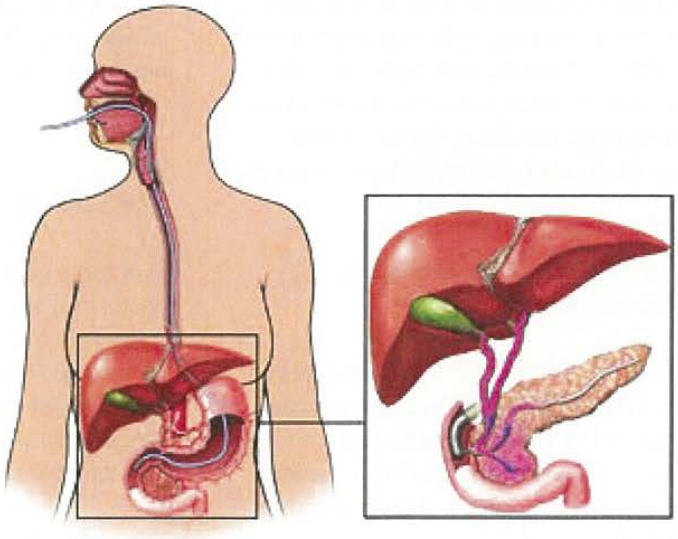
✓ It is helpful to keep track of your test results at all times. Ask your doctors questions about the results.

ERCP (endoscopic retrograde cholangiopancreatography)
An ERCP uses an endoscope and x-rays to make pictures of the inside of the body. For this test, the endoscope will be inserted through your mouth and guided down your throat and stomach to the duodenum. Next, a thinner tube called a catheter will be passed through the middle of the endoscope. The catheter will be used to inject a contrast dye into the pancreatic and bile ducts. **See Figure 5.**

Then, an x-ray machine will take pictures. The contrast dye allows the pancreatic and bile ducts to be clearly seen on the x-ray pictures. An ERCP takes about 30 to 90 minutes. For this test, your doctor will first give you a sedative. The sedative will make you feel relaxed or sleepy. After the test, your throat may feel sore and you may feel bloated.

Figure 5.
ERCP

For this test, the endoscope will be inserted through your mouth and guided down your throat and stomach to the duodenum.



Laparoscopy
This test is a type of surgery that allows your doctors to see organs in your belly area (abdomen). It uses a tool like an endoscope called a laparoscope. For this test, the laparoscope will be inserted through a tiny cut in your abdomen. Laparoscopy is done under general anesthesia. This is a controlled loss of wakefulness from drugs. This surgery is done in an operating room and takes about 30 minutes. After the surgery, you may feel tired and may have some pain. You may also have a small scar after the cut has healed. It is usually done on an outpatient basis.

Blood tests

Blood tests check for signs of disease, how well organs are working, and treatment results. One common blood test is a CBC (**c**omplete **b**lood **c**ount). This test counts the number of blood cells in a blood sample. Too few or too many cells may signal there's a problem. A blood chemistry test is another common type of blood test. This test measures the levels of different chemicals in the blood. Cancer or other diseases can cause abnormal levels that are too low or too high.

Other blood tests may be done to check for pancreatic cancer. They may include:

- Liver function tests measure the health of your liver by measuring chemicals that are made or processed by the liver. Levels that are too high or low signal that the liver is not working well or that some blockage of the bile ducts is occurring.
  - One of the liver function tests that is typically measured is bilirubin, a chemical that gives bile its color. There may be too much bilirubin in the blood if a tumor is blocking a bile duct and preventing the free flow of bile from the liver into the intestines. Too much bilirubin causes a yellowing of the eyes and skin (jaundice).
- CA 19-9 is a substance found in blood that is often high in people with pancreatic cancer. This test is not used by itself to diagnose pancreatic cancer. A CA 19-9 blood test is also often measured routinely during treatment to see if the treatment is working. It may also be measured before and after surgery.
  - Other health problems besides pancreatic cancer can cause high levels of CA 19-9. This includes pancreatitis or a benign blockage in the biliary system (for example, due to gallstones).

Your doctor may change your treatment plan based on the results of blood tests. How often you have blood tests depends on the cancer treatments you receive and other factors. Common side effects of blood tests are bruising and dizziness.

Tissue tests

In order to confirm a tumor in the pancreas, your doctor may want you to have a biopsy. A biopsy is the removal of a small sample of tissue from the body for testing. The biopsy sample will be sent to a lab so a pathologist can examine it with a microscope for cancer cells. A pathologist is a doctor who's an expert in testing cells and tissues for disease.

Lab tests, conducted by the pathologist, often find cancer cells if any are present in the tissue sample. If no cancer cells are found, a biopsy sample may be taken from a different spot of the pancreas if your doctors still think there's cancer. More than one type of biopsy may be used. The types of biopsies used for pancreatic cancer are described next.

FNA biopsy

An FNA biopsy is the type of biopsy used most often to confirm pancreatic cancer. This type of biopsy uses a very thin needle to remove the tissue sample. There are two main ways to perform an FNA biopsy.

EUS-FNA

An FNA biopsy can be done during EUS with a thin needle attached to the end of the endoscope. This is called an EUS-guided FNA biopsy or EUS-FNA. For this type of biopsy, the endoscope is passed through the mouth and throat down into your stomach. An ultrasound probe at the end of the endoscope bounces sound waves off organs and tissues to make a picture of the inside of your body. Your doctor uses these pictures to guide the endoscope and needle to the right spot. Then the needle is inserted through your stomach or duodenum and into the tumor in your pancreas.

CT or ultrasound-guided FNA

A second way to perform an FNA biopsy is to insert a thin needle through the skin and into the tumor using a CT scan or ultrasound for guidance. This is called a CT or ultrasound-guided FNA biopsy. The CT scan takes many pictures of a part of the body from different angles using x-rays. An ultrasound is a test that uses sound waves to take pictures of the inside of the body. Your doctor will use the pictures from these imaging tests to find the tumor in your pancreas and guide the needle to the right spot. For this type of biopsy you will be given local anesthesia. It is called local because this anesthesia causes a loss of feeling in a small area of the body.

Besides FNA, a biopsy of the tumor may also be done during surgery or laparoscopy. During ERCP, samples may be removed from the pancreatic duct. In this case, the samples are removed with a small brush at the end of the endoscope. These samples are called brushings.

A biopsy is often done in less than 1 hour. It is generally a safe test. Before a biopsy, you may be asked to stop eating, stop taking some medicines, or stop smoking. You may have some pain after a CT or ultrasound-guided FNA biopsy. After an EUS-FNA biopsy, your throat may be sore and you may feel bloated. Talk to your doctor about any side effects you have.

Cancer staging

The cancer stage is a rating by your doctors of how far the cancer has grown and spread. Which treatment is best for you depends on how far the cancer has spread. There are two ways that may be used to stage or classify pancreatic cancer.

The AJCC (**A**merican **J**oint **C**ommittee on **C**ancer) system groups pancreatic cancer into five stages (stage 0 – stage IV). The stages are defined by the growth of the primary tumor and its spread to other sites in the body. In the AJCC system, cancer may be staged twice. Thus, it is based on tests before surgery and then based on tests of tissue removed during surgery. Some doctors use this staging system to plan treatment.

However, most NCCN doctors do not use the AJCC staging system. Rather, they classify pancreatic cancer and plan treatment based on the results of imaging and other tests done before surgery. Imaging tests provide the key information used to determine the clinical stage of pancreatic cancer.

In this system, doctors classify pancreatic cancer into four main groups: resectable, borderline resectable, locally advanced unresectable, and metastatic. Because this is the system most NCCN doctors use, recommendations in the treatment guides in Part 5 are based on this system and its four groups of pancreatic cancer:

- Resectable cancer has not spread outside the pancreas and appears to be easily treated with surgery.
- Borderline resectable cancer is confined to the pancreas but approaches nearby structures or severe symptoms are present, raising concern that the cancer might not be resectable with clear margins.
- Locally advanced unresectable cancer has spread outside the pancreas to nearby blood vessels or other tissues and cannot be treated with surgery.
- Metastatic cancer has spread outside the pancreas to organs and tissues far away in the body.

Performance status

Your state of general health will be rated using a performance status scale. The PS (**p**erformance **s**tatus) indicates a person's general level of fitness. A commonly used scale is the ECOG (**E**astern **C**ooperative **O**ncology **G**roup) Performance Scale with scores ranging from 0-4.

Zero means you are fully active, 1 means you are still able to perform light to moderate activity, 2 means you can still care for yourself but are not active, 3 means you are limited to the chair or bed more than half of the time, and 4 means you need someone to care for you and are fully limited to a chair or bed. This score helps doctors decide what kind of treatment is most suitable for you.

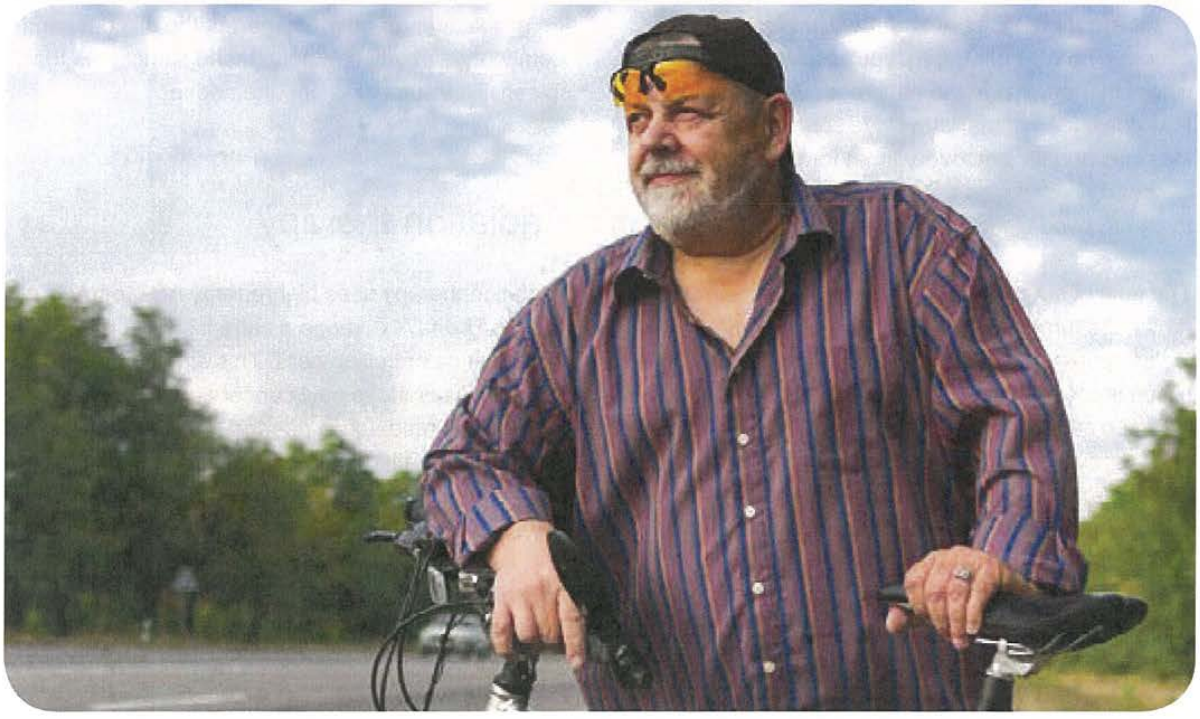
Patients with a PS of 3 or 4 are often recommended to receive supportive, or palliative, care rather than aggressive cancer treatment. See Part 4 for more information on supportive care.

Review

- Cancer tests are used to find cancer, plan treatment, and check how well treatment is working.
- Your health history and a body exam inform your doctor about your health.
- Blood tests check for signs of disease.
- Tests that take pictures of the inside of your body may show cancer.
- Tests of tissue or fluid removed from your body may find cancer.
- The cancer stage is a rating by your doctors of how far the cancer has grown and spread.
- The PS (**p**erformance **s**tatus) indicates a person's general level of fitness.

3
Overview of cancer treatments

22 Surgery
22 Radiation therapy
24 Chemotherapy
25 Targeted therapy
25 Side effects of treatment
26 Clinical trials
26 Cancer treatment
27 Review



There is more than one treatment for pancreatic cancer. The main types are described in this chapter. This information may help you with the treatment guides in Part 5. It may also help you know what to expect during treatment. Not every person with pancreatic cancer will receive every treatment listed.

Surgery

Surgery is an operation to remove or repair a part of the body. Sometimes surgery can be used as the main treatment to remove pancreatic cancer. NCCN experts recommend that surgery for pancreatic cancer should only be done at a hospital that does more than 15 pancreatic surgeries each year. Hospitals that perform many pancreatic surgeries often have better results.

There are three types of surgery used for pancreatic cancer. The type of surgery you receive depends on where the tumor is in the pancreas. Some surgeons now consider minimally invasive surgery (smaller incisions and less recovery time) for pancreatic cancer. This depends on whether the cancer is able to be removed with this type of surgery.

The goal of surgery is to remove all of the cancer. To do so, the tumor is removed along with some normal-looking tissue around its edge. The normal-looking tissue is called the surgical margin. A clear margin is when no cancer cells are found in the normal-looking tissue around the edge of the tumor. This is also referred to as a negative margin. A positive margin is when cancer cells are found in the normal-looking tissue.

Whipple procedure

The surgery for a tumor in the widest part (head) of the pancreas is called a pancreatoduodenectomy, also known as a Whipple procedure. This surgery removes the head of the pancreas, the gallbladder, duodenum (first part of the small bowel), part of the bile duct, and often part of the stomach. Some of the lymph nodes near your pancreas will be removed to test for cancer cells. Once the cancer has been removed, your surgeons will connect your organs so you can digest food.

Distal pancreatectomy

The surgery for a tumor in the middle part (body) or narrow end (tail) of the pancreas is called a distal pancreatectomy. This surgery removes the body and tail of the pancreas, some nearby lymph nodes, and sometimes the spleen and its blood vessels.

Total pancreatectomy

The surgery for cancer in a large portion of the pancreas is called a total pancreatectomy. This surgery removes the entire pancreas. It also removes the gallbladder, duodenum, part of the bile duct and stomach, nearby lymph nodes, and sometimes the spleen. This surgery is not often done.

Radiation therapy

Radiation therapy uses high-energy rays to treat cancer. The rays damage a cell's instructions for making and controlling cells. This either kills the cancer cells or stops new cancer cells from being made. More research is needed to know the best practice for treating pancreatic cancer with radiation. This section explains the methods of radiation therapy that are currently used.

For pancreatic cancer, radiation is often given with chemotherapy. Chemotherapy may improve how well radiation works. This combined treatment is called chemoradiation.

External radiation

For pancreatic cancer, radiation is often given using a machine outside the body. This method is called EBRT (**e**xternal **b**eam **r**adiation **t**herapy). For EBRT, your doctors will first take pictures of the tumor with a CT scan using contrast dye. This process is called simulation. Your doctors will use the pictures to help target the tumor and plan radiation treatment.

Using the CT scan pictures, your doctors will plan the radiation dose, number and shape of radiation beams, and number of treatment sessions. Beams are shaped with computer software and hardware added to the radiation machine.

During treatment, you will lie on a table in the same position as done during simulation. Devices may be used to keep you from moving so that the radiation targets the tumor. Likewise, methods may be applied to control breathing. Radiation beams are aimed at the tumor with help from ink marks on the skin or tiny gold seeds placed in the tumor.

You will be alone while the technician operates the machine from a nearby room. He or she will be able to see, hear, and speak with you at all times. As treatment is given, you may hear noises. A treatment session can take about 30 to 60 minutes. The types of EBRT used for pancreatic cancer include:

- 3D-CRT (three-**d**imensional **c**onformal **r**adiation **t**herapy) is given in small doses for a few weeks with beams that match the shape of the tumor.
- IMRT (**i**ntensity-**m**odulated **r**adiation **t**herapy) is given in small doses for a few weeks with beams of different strengths based on the thickness of the tumor.
- SBRT (**s**tereotactic **b**ody **r**adiation **t**herapy) is given in higher doses over a few visits, and precisely targets the tumor.

Order of treatments

Most people with pancreatic cancer will receive more than one type of treatment. When and why treatments are given can be hard to understand. Part 5 gives more details. Here, the terms that describe the order of treatments are explained.

Neoadjuvant treatment is given to shrink the tumor before surgery.

Adjuvant treatment is given after primary treatment to kill any remaining cancer cells.

Primary treatment is the main treatment given to rid the body of cancer.

First-line treatment is the first set of treatments given.

Second-line treatment is the next set of treatments given after the first or previous treatments failed.

Internal radiation

The other radiation method is internal radiation therapy, also called brachytherapy. Internal radiation therapy involves placing a radioactive object in or near the tumor. For pancreatic cancer, internal radiation is given during surgery through a plastic tube that is removed before the surgical cuts are sewn closed.

Chemotherapy

Chemotherapy is the use of drugs to treat cancer. Many people refer to this treatment as "chemo." Chemotherapy kills fast-growing cells throughout the body, including cancer cells and normal cells. The chemotherapy drugs used for pancreatic cancer are listed in Guide 3.

Chemotherapy for pancreatic cancer may be given for all stages of pancreatic cancer. This includes:

- Neoadjuvant treatment for resectable or borderline resectable disease
- Adjuvant treatment for resectable disease
- Locally advanced unresectable disease
- Metastatic disease

Guide 3. Chemotherapy drugs

Chemotherapy drug names
• Capecitabine
• Cisplatin
• Docetaxel
• 5-FU (5-fluorouracil)
• Gemcitabine
• Irinotecan
• Irinotecan liposome injection
• Oxaliplatin
• Nab-paclitaxel

When only one drug is used, it is called a single agent. However, chemotherapy drugs differ in the way they work, so often more than one drug is used. A combination regimen is the use of two or more chemotherapy drugs. Leucovorin (also called folinic acid) is sometimes given along with 5-FU (5-fluorouracil) to improve how well the chemotherapy works. One example of a combination regimen used for pancreatic cancer is FOLFIRINOX (folinic acid, 5-fluorouracil, irinotecan, oxaliplatin). Often, combination regimens are referred to by the main chemotherapy drug used. For gemcitabine-based combination therapy, the main drug used is gemcitabine. For fluoropyrimidine-based therapy, the main drug used is 5-FU but capecitabine is also an option.

Chemotherapy for pancreatic cancer can be given as a pill taken by mouth or as a liquid that is slowly injected into a vein. Most of the chemotherapy drugs listed in Guide 3 are given as injections. How long it takes to give the chemotherapy injection depends on which chemotherapy you receive.

Chemotherapy is given in cycles of treatment days followed by days of rest. These cycles vary in length depending on which drugs are used. Often, the cycles are 14, 21, or 28 days long. These cycles give the body a chance to recover before the next treatment. Thus, chemotherapy treatment includes some days without treatment.

Targeted therapy

Targeted therapy is the use of drugs to treat cancer. Targeted therapy drugs target a specific or unique feature of cancer cells not generally present in normal cells. Because these drugs specifically target cancer cells, they may be less likely to harm normal cells throughout your body. Erlotinib is a targeted therapy used for pancreatic cancer. It treats cancer by blocking signals sent from the edge of a cancer cell that tell the cell to grow. Erlotinib is used with chemotherapy to treat pancreatic cancer. It is a pill that is taken by mouth and swallowed. It then travels in the bloodstream to treat cancer throughout the body.

Side effects of treatment

Side effects are unplanned or unwanted physical or emotional conditions caused by cancer treatment. Each treatment for pancreatic cancer can cause side effects, but how your body will respond can't be fully known. You may have different side effects than someone else.

Controlling side effects is important for your quality of life. There are many ways to limit these problems. However, listing all the ways is beyond the scope of this book. In general, changes in behavior, diet, or medications may help. Tell your treatment team if you have any side effects. It is important they know how you are feeling.

- **Surgery** may cause weakness, tiredness, and pain. Other common side effects are difficulty digesting food, diabetes, leakage of pancreatic fluids, and surgical scars.
- **Radiation therapy** may not cause side effects until after the first few visits. Over time, you may have discomfort in your belly area (abdomen). Other common side effects are nausea, diarrhea, fatigue, and not feeling hungry.
- **Chemotherapy** side effects depend on the drug, amount taken, length of treatment, and the person. In general, side effects are caused by the death of fast-growing cells, which are found in the gut, mouth, and blood. As a result, common side effects include diarrhea, nausea, vomiting, mouth sores, tiredness or weakness, numbness or tingling in the hands or feet, skin and nail changes, hair loss, swelling, and not feeling hungry.
- **Targeted therapy** side effects depend on the drug and what it targets. Common side effects of erlotinib are skin rash, diarrhea, nausea, feeling tired, and not feeling hungry. The rash may appear on the face, neck, or trunk of the body within the first 2 weeks of treatment.

Not all of the side effects of cancer treatment are listed here. Ask your treatment team for a full list of side effects of any treatment you consider.

Clinical trials

A clinical trial is a type of research study that people choose to take part in. Clinical trials help doctors learn how to prevent, diagnose, and treat a disease like cancer. Because of clinical trials, doctors find safe and helpful ways to improve your cancer care. This guide has information about many of those tests and treatments used to help people with cancer.

Clinical trials go through levels or phases of testing. These phases help move the research along to find out what works best for patients with cancer.

- Phase I looks at how much treatment to give and how to give it.
- Phase II tests for side effects and how it works on the cancer type.
- Phase III compares the new treatment (or new use of treatment) to what is commonly used.
- Phase IV follows late side effects and if the treatment still works after a long period.

All clinical trials have a plan and are carefully led by a medical team. Patients in a clinical trial are often alike with their cancer type and general health. You can join a clinical trial when you meet certain terms (eligibility criteria).

If you decide to join a clinical trial, you will need to review and sign a paper called an informed consent form. This form describes the clinical trial in detail, including the risks and benefits. Even after you sign consent, you can stop taking part in a clinical trial at any time.

Some benefits:

- You'll have access to the most current cancer care
- You will be closely watched by your medical team
- You may help other patients with cancer

Some risks:

- Like any test or treatment, there may be side effects
- New tests or treatments may not work
- You may have to visit the hospital more

Cancer treatment

There is no single treatment that is best for all patients. There is often more than one treatment option, including clinical trials. Treatment planning for pancreatic cancer takes into account many factors, such as:

- Location of the cancer
- Your general health
- Treatment side effects
- Costs of treatment
- Changes to your life
- What you want from treatment
- Your feelings about side effects

The cancer treatment that you and your doctors agree on should be reported in the treatment plan. It is also important to note the goal of treatment and the chance of a good treatment outcome. In addition, all known side effects should be listed and the time required to treat them should be noted.

Your treatment plan may change because of new information. You may change your mind about treatment. Tests may find new results. How well the treatment is working may change. Any of these changes may require a new treatment plan.

Review

- Surgery removes the tumor along with some normal-looking tissue around its edge.
- Radiation kills cancer cells or stops new cancer cells from being made.
- Drugs can be used to kill cancer cells anywhere in the body.
- Chemotherapy drugs kill fast-growing cells, including cancer cells and normal cells.
- Targeted therapy drugs specifically target cancer cells.
- Clinical trials are an important treatment option for people with pancreatic cancer.
- There is often more than one treatment option for patients, including clinical trials.

Complementary and alternative medicine

CAM (**c**omplementary and **a**lternative **m**edicine) is a group of treatments sometimes used by people with cancer. Many CAMs are being studied to see if they are truly helpful.

- Complementary medicines are meant to be used alongside standard therapies, most often for relaxation, improving your health, or to prevent or reduce side effects.
- Alternative medicine is treatment or techniques that are used instead of standard treatments such as chemotherapy or radiation. Some are sold as cures even though they haven't been proven to work in clinical trials.

Many cancer centers or local hospitals have complementary therapy programs that offer acupuncture, yoga, and other types of therapy.

It's important to tell your treatment team if you are using any complementary medicine, especially supplements, vitamins, or herbs. Some of these things can interfere with your cancer treatment. For more information about CAM, ask your doctor and visit the websites in Part 6.

4
Supportive care

29 Blocked bile duct

29 Blocked stomach

30 Pain

30 Malnutrition or trouble eating

30 Advance care planning

31 Review

As pancreatic cancer grows, it can cause serious health problems such as pain, blockage, and difficulty eating. It is important to know about these health issues and talk to your treatment team to get the support you need. This section explains some of the main challenges you may face and the recommended supportive care for each.

Supportive care is treatment given to relieve symptoms caused by pancreatic cancer or cancer treatment. It is also referred to as palliative care. Supportive care is an important part of care for pancreatic cancer. Pancreatic cancer not only affects your body, it can also cause distress. Some patients have depression, anxiety, and sleeping problems. Because of this, it is helpful to talk to your doctor and with those whom you feel most comfortable about how you are feeling. Let them know how they can help or guide you when it comes to supportive care.

Ask questions and seek information about supportive care options. Other members of your treatment team may also include a social worker, psychologist, registered dietitian, or specialist who treats pain.

Blocked bile duct

A tumor in the pancreas may grow large enough to block your bile duct. A bile duct is a small tube that drains digestive fluid (bile) from the liver. The common bile duct carries bile from the liver through the pancreas and to the first part of the small intestine (duodenum). A blocked duct causes bile to build up in the liver. As a result, you may have pain, itching, discomfort, and jaundice. This blockage can cause an infection of the bile duct called cholangitis.

A blocked bile duct may also be treated by placing a biliary stent or doing a biliary bypass. A biliary stent is a tiny tube that is placed in the bile duct to unblock it or keep it open. Before the stent can be placed, bile may need to be drained through an opening in the side of the body. However, you may need a new or second stent during or after cancer treatment if the tumor grows larger. A bypass is a surgery to re-route the flow of fluids in the body. A biliary bypass is a surgery to re-route the flow of bile from the common bile duct into the small intestine. The result is that the bile flow avoids (bypasses) the blocked part of the duct.

Blocked stomach

A tumor in the pancreas may also grow large enough to block eaten food from passing out of your stomach through the first part of the small intestine (duodenum). This blockage can cause pain, vomiting, and other problems. Treatments for a blocked stomach include a stent, a PEG (**p**ercutaneous **e**ndoscopic **g**astrostomy) tube, or a duodenal bypass (gastrojejunostomy).

A stent is an expandable tube that is placed in the duodenum to unblock it and keep it open. A PEG tube is a tube that is inserted through a cut in the abdomen and placed in the stomach to give food. A duodenal bypass is a surgery to re-route the path eaten food takes from the stomach into the small intestine. The result is that the path out of the stomach avoids (bypasses) the blocked part of the duodenum. This surgery may also be done as a preventive measure if there is a high risk that your stomach may become blocked.

Pain

You may have pain caused by the cancer. Pain can occur when the tumor grows into nearby nerves or presses against other organs. Pain can be treated with various types of medication (such as opioids, which are morphine-like drugs). Another treatment is to inject alcohol (ethanol) into nerves around the pancreas to destroy them. This procedure is called a celiac plexus neurolysis, or nerve block. The procedure can be performed under either CT or EUS guidance. Some patients may also benefit from radiation therapy, with or without chemotherapy, to help relieve the pain.

Malnutrition or trouble eating

Healthy eating is always important. It includes eating a balanced diet, eating the right amount, and drinking enough fluids. Pancreatic cancer or its treatment may make healthy eating a challenge by causing you to feel not hungry, have abdominal cramps, or have trouble digesting food. A registered dietitian who is an expert in nutrition and food can help.

You may also need drugs for diabetes. Diabetes is a disease that causes high levels of sugar in the blood. You may need pills that replace your digestive enzymes because your pancreas has been removed or isn't working well because of the tumor. Digestive enzymes are proteins that help to break down (digest) eaten food for the body.

Advance care planning

Talking with your doctor about your prognosis can help with treatment planning. If the cancer can't be controlled or cured, a care plan for the end of life can be made.

Advance care planning is useful for:

- Knowing what to expect
- Making the most of your time
- Lowering the stress of caregivers
- Having your wishes followed
- Having a better quality of life
- Getting good care

Advance care planning starts with an honest talk between you and your doctors. You don't have to know the exact details of your prognosis. Just having a general idea will help with planning. With this information, you can decide at what point you'd want to stop chemotherapy or other treatments, if at all. You can also decide what treatments you'd want for symptom relief, such as radiation, surgery, or medicine.

Another part of the planning involves hospice care. Hospice care doesn't include treatment to fight the cancer but rather to reduce symptoms caused by cancer. Hospice care may be started because you aren't interested in more cancer treatment, no other cancer treatment is available, or because you may be too sick for cancer treatment. Hospice care allows you to have the best quality of life as possible. Care is given all day, every day of the week. You can choose to have hospice care at home or at a hospice center.

An advance directive describes the treatment you'd want if you weren't able to make your wishes known. It also can name a person whom you'd want to make decisions for you. It is a legal paper that your doctors have to follow. It can reveal your wishes about life-sustaining machines, such as feeding tubes. It can also include your treatment wishes if your heart or lungs were to stop working. If you already have an advance directive, it may need to be updated to be legally valid.

Review

- Supportive care, also called palliative care, is the treatment of the health conditions caused by pancreatic cancer and its treatment.
- A stent is a tiny tube that may be used to unblock a bile duct or the stomach.
- Pain may be treated with medication, a nerve block, or radiation with or without chemotherapy.
- A registered dietitian who is an expert in nutrition and food can help if it is hard for you to eat or digest food.
- Advance care planning starts with an honest talk between you and your doctors.

5
Treatment guide

33 Pancreatic cancer testing
Presents the first set of tests recommended to confirm pancreatic cancer and plan treatment.

37 Resectable pancreatic cancer
Presents the recommended treatment for cancer that hasn't grown beyond the pancreas and can be removed with surgery.

42 Borderline resectable pancreatic cancer
Presents the recommended treatment for cancer that is confined to the pancreas but approaches nearby structures or causes severe symptoms such that the cancer can't be removed by surgery.

49 Locally advanced unresectable pancreatic cancer
Presents the recommended treatment for cancer that has spread outside the pancreas to nearby blood vessels or other tissues and can't be removed with surgery.

56 Metastatic pancreatic cancer
Presents the recommended treatment for cancer that has spread far from the pancreas.

59 Review

Part 5 is a guide through the treatment options for people with pancreatic cancer. It shows what tests and treatments are recommended under which conditions. This information is taken from the treatment guidelines written by NCCN experts for pancreatic cancer doctors.

Pancreatic cancer testing

Guide 4. Tests to confirm pancreatic cancer

Test and results	Disease	Next tests
Pancreatic protocol CT scan-shows mass in pancreas	• No metastases	• Team of doctors review plan • Possible EUS • Liver function tests • Chest CT preferred or x-ray
	• Metastases	• Biopsy to confirm
Pancreatic protocol CT scan-shows no mass in pancreas	• No metastases	• Team of doctors review plan • Chest CT preferred or x-ray • MRI/MRCP or ERCP as needed
	• Metastases	• Biopsy to confirm

Certain tests are recommended to confirm (diagnose) pancreatic cancer and see how far it has spread. The extent of the cancer affects which treatment is best for you. For pancreatic cancer, imaging tests are used to determine the extent of cancer. Imaging tests take pictures of the inside of the body.

Guide 4 shows the initial tests recommended for pancreatic cancer. Testing is started when your doctors find signs of pancreatic cancer. Doctors will ask about your family history before the tests.

Initial tests

The first test recommended to check for pancreatic cancer is a special type of CT scan using a pancreatic protocol. A pancreatic protocol scan is done in a special way to get the clearest and most accurate images of the pancreas. It allows your doctors to assess whether there is any tumor in the pancreas, and if so, whether the tumor involves any of the nearby blood vessels.

Results and next tests

If the initial CT scan shows a tumor in your pancreas, then your doctor will order a few more tests to plan treatment. A team of doctors who are experts in different areas of cancer care should review the test results and plan treatment.

These next tests may include:

- EUS with FNA biopsy of the pancreas. This is sometimes also performed if the CT scan does not clearly show a tumor in the pancreas, but your doctor is still concerned about the possibility of cancer.
- ERCP or MRCP especially if you have jaundice and evidence of a blocked bile duct.
- Blood tests to check if your liver is working well.
- Imaging tests that usually include a CT scan of your chest.
- Tissue sample (biopsy) if there are signs of metastases. For example, a biopsy of the liver if disease is seen on an imaging test.

Next steps

If no metastases were found, see Guide 5 for recommended follow-up tests. If metastases were found, see the section on metastatic pancreatic cancer treatment later in this chapter.

Guide 5. Pre-surgery evaluation

Symptoms	Symptom control	Tests
No jaundice	→	• CA 19-9
Jaundice + symptoms of cholangitis or fever	→ • Plastic stent or consider metal stent if cancer confirmed and • Antibiotic	→ • CA 19-9
Jaundice + no symptoms of cholangitis and fever	→	

Guide 5 shows the next steps that are recommended when initial tests show no signs of cancer outside the pancreas. When cancer is only in the pancreas, surgery may be a treatment option. When deciding if surgery is possible, it is recommended that doctors consult a multidisciplinary team of experts at a hospital that does more than 15 pancreatic cancer surgeries each year. The tests in the guide above will help your doctor decide if surgery is a good option for you. First, your doctors will treat any symptoms of cancer you may have.

Tests

CA 19-9 is a substance found in blood. Pancreatic cancer can cause high levels of CA 19-9 in the blood. Thus, a CA 19-9 blood test is recommended before surgery to check for signs of advanced cancer. CA 19-9 levels can also be high when there is too much bilirubin in the blood due to a blockage of the bile duct(s). If you are jaundiced with high bilirubin levels, your doctors should wait to test your CA 19-9 levels since they will want to know if the high CA 19-9 level is being caused by cancer or bilirubin.

Symptoms

Symptoms may include abdominal or back pain, weight loss, decreased appetite, and jaundice. Jaundice is a yellowing of the eyes and skin, and can also be accompanied by itching, tea-colored urine, and clay-colored stools.

Symptom control

If you have jaundice, then your doctors will place a stent in the bile duct (typically by ERCP) to relieve the blockage in your bile duct. You will often be given antibiotic drugs along with the stent, especially if you have signs of cholangitis (bile duct infection) such as fevers or chills. If you will have surgery for your pancreatic cancer in the very near future, placement of a bile duct stent may not be necessary.

Based on the results of the tests, your doctors will decide if the cancer can be removed by surgery.

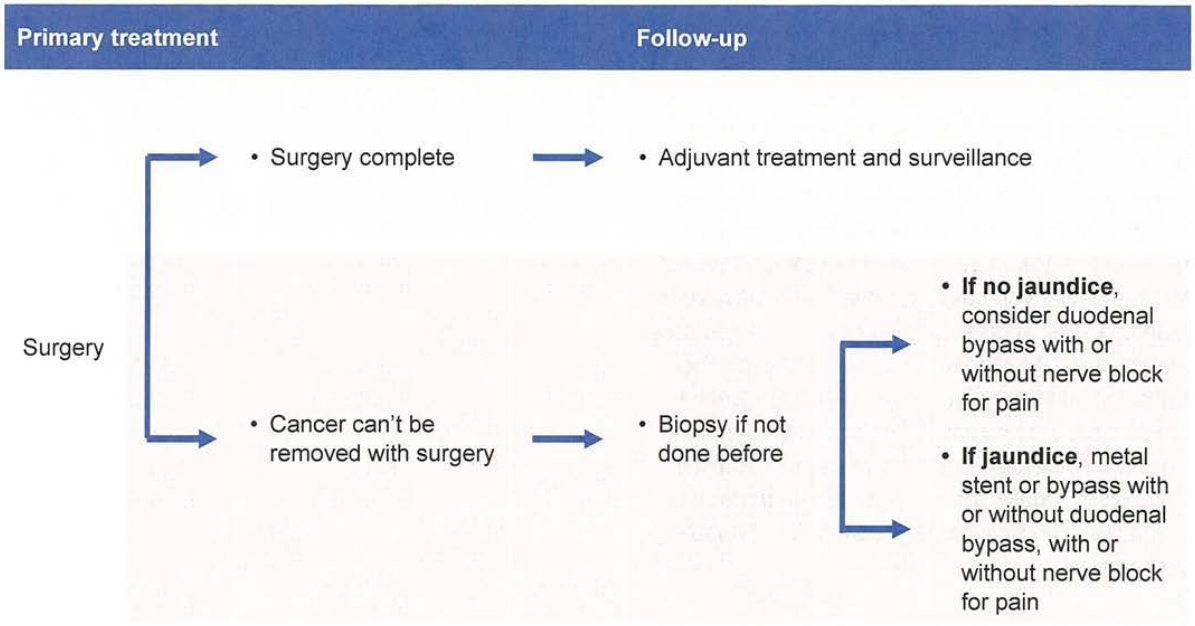
- Cancer that is confined to the pancreas without significant involvement of nearby blood vessels is called resectable pancreatic cancer.
- Cancer that is confined to the pancreas but involves nearby blood vessels or structures to a greater extent (so that it's unclear if it can be completely removed by surgery right away) is called borderline resectable pancreatic cancer.
- Cancer that involves nearby blood vessels or other structures to such a significant extent that it cannot be successfully removed by surgery is called locally advanced unresectable pancreatic cancer.

Next steps

For resectable pancreatic cancer, see Guides 6 to 8 for treatment recommendations. For borderline resectable pancreatic cancer, see Guides 9 to 12 for treatment recommendations. For locally advanced unresectable pancreatic cancer, see Guides 14 to 15 for treatment recommendations.

Resectable pancreatic cancer

Guide 6. Primary treatment with surgery



Guide 6 shows the recommended treatments for cancer that is in the pancreas only. Primary treatment refers to the first or main treatment used to treat cancer. Surgery is the primary treatment for resectable pancreatic cancer.

Tests

Before surgery to remove the cancer, your doctors may want to do a surgical test called a staging laparoscopy. It is used to make sure there is no evidence of metastases in your abdominal cavity that could not be seen by imaging tests. Your doctors may consider this test if you are at higher risk of having metastases.

Primary treatment and follow-up

The type of surgery you will have depends on the size and location of the tumor. At the start of the surgery, your doctors may find that the cancer has spread too much and can't be removed by surgery. In that case, the surgeon may still want to do an operation to connect the stomach to the jejunum (part of small intestine). This creates a path between the stomach and of the middle section of the small intestine. This is called a duodenal bypass (gastrojejunostomy) and it may be done if cancer is blocking the stomach. He or she may also want to re-route the flow of bile around the blocked part of the bile duct if you have or are at risk of developing jaundice. This is called a biliary bypass. If you have severe pain, the surgeon may also inject alcohol (ethanol) into the nerves in the abdomen (called celiac plexus) to destroy them to relieve the pain. This is a nerve block referred to as celiac plexus neurolysis. Finally, the surgeon should perform a biopsy to confirm pancreatic cancer if not done previously.

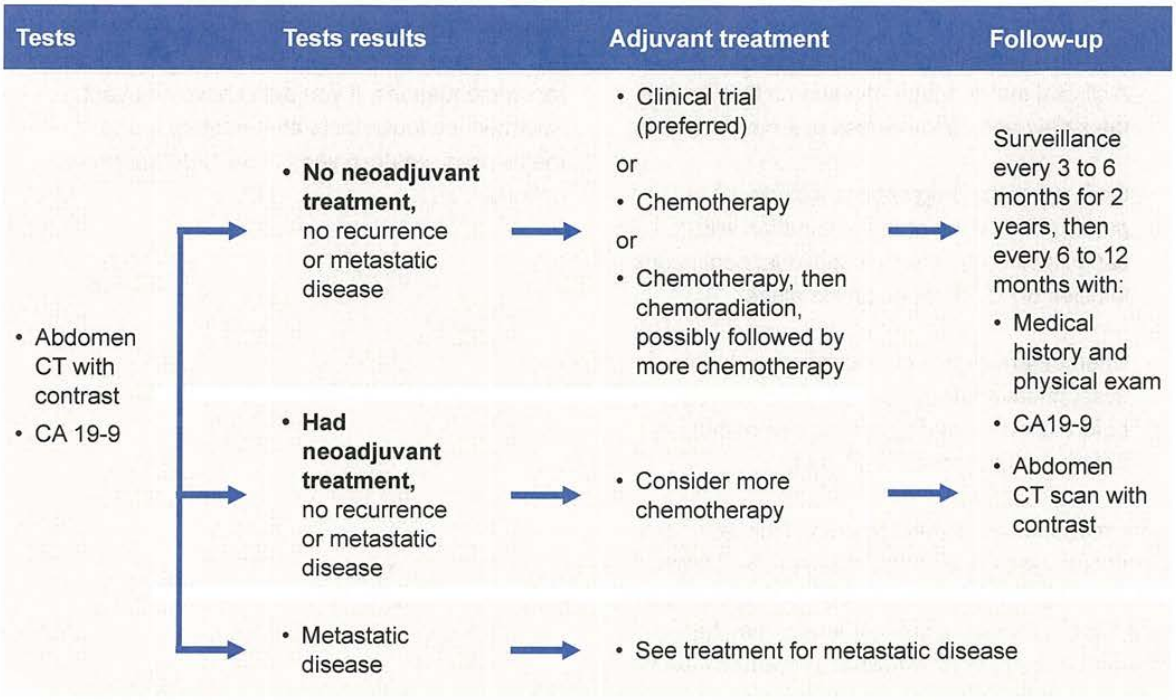
For cancer that cannot be removed by surgery, the next treatments depend on how far the cancer has spread. Cancer that has spread outside the pancreas to involve nearby blood vessels or other structures is called locally advanced unresectable. Cancer that has spread outside the pancreas to far sites in the body is called metastatic.

On the other hand, if surgery is successful and all of the cancer can be removed, you will have more treatment to try to kill any remaining cancer cells. This treatment is given after surgery is complete. It is called adjuvant treatment.

Next steps

If surgery was completed, see Guide 7 for adjuvant treatment recommendations. If surgery wasn't completed, see treatment for locally advanced or metastatic pancreatic cancer.

Guide 7. Adjuvant treatment after surgery



Guide 7 shows the next tests and treatments recommended after primary treatment with surgery for resectable pancreatic cancer. Primary treatment is the first or main treatment given to rid the body of cancer. Adjuvant treatment is treatment given after primary treatment to kill any remaining cancer cells.

Tests

Before beginning adjuvant treatment, you will have a CT scan of the abdomen and CA 19-9 blood test. These tests are done to check for signs of recurrence (return of cancer after treatment).

If the tests do not show any signs of recurrence, then you will receive adjuvant treatment. Adjuvant treatment should only be started after you've fully recovered from surgery. This treatment usually starts 4 to 8 weeks after surgery.

Adjuvant treatment

There are 3 main options for adjuvant treatment:

- Joining a clinical trial is strongly recommended. A clinical trial is a type of research that studies the safety and effectiveness of a new treatment.
- Chemotherapy drug options include gemcitabine alone or in combination with capecitabine, 5-FU with leucovorin, continuous infusion 5-FU, or capecitabine alone.
- Chemotherapy plus chemoradiation. In this case, chemotherapy may be given entirely before chemoradiation, or sometimes both before and after chemoradiation.

Recommended chemotherapy drugs include gemcitabine alone or with capecitabine, 5-FU with leucovorin, continuous infusion 5-FU, or capecitabine alone. During radiation, chemotherapy may be added with either fluoropyrimidine (preferred), such as continuous infusion 5-FU or capecitabine, or gemcitabine.

Follow-up

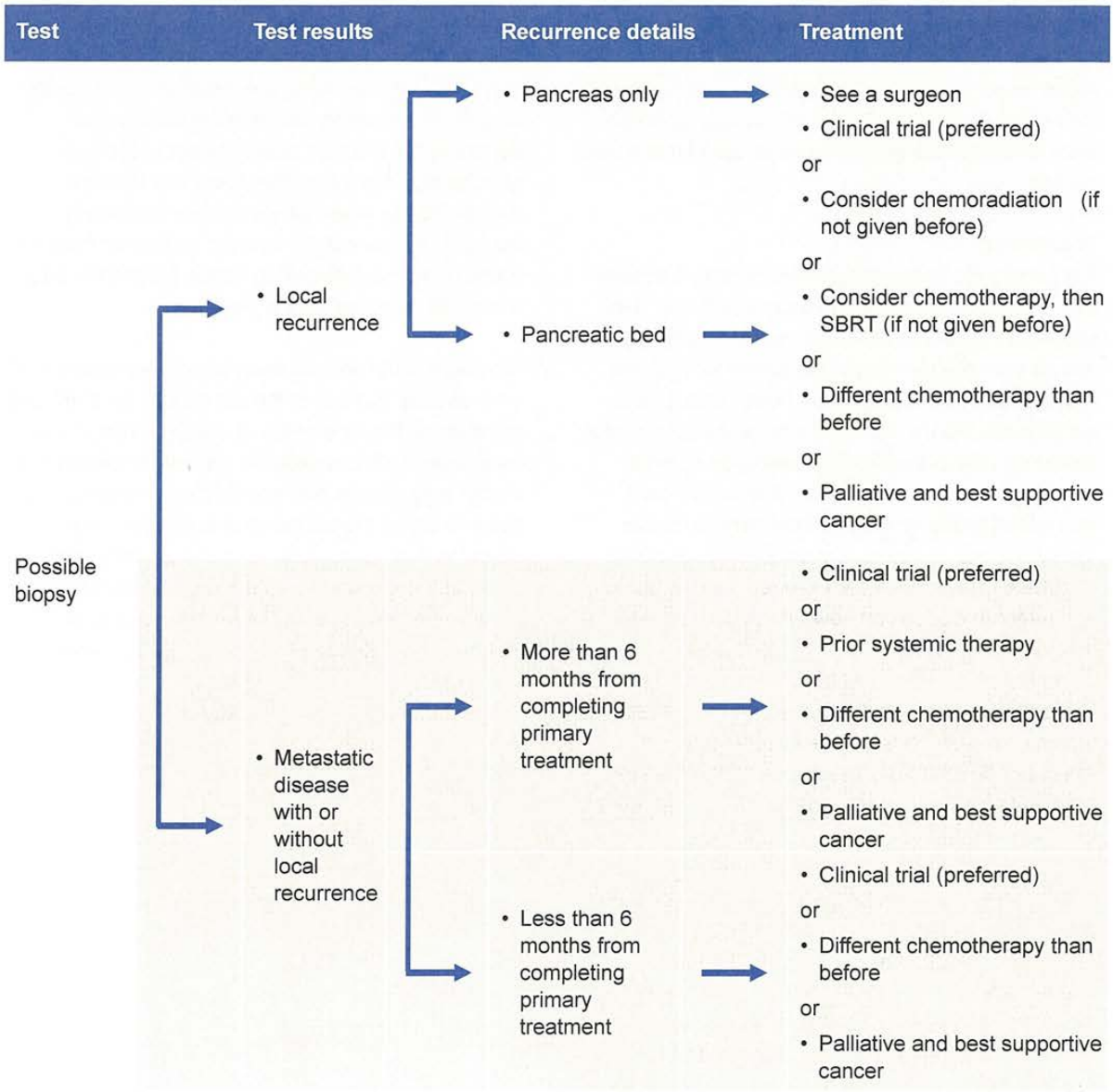
After completing adjuvant treatment, you will have follow-up tests. Follow-up tests are tests given after treatment to check how well treatment worked. These tests look for signs of cancer return (recurrence) or spread (metastasis) after treatment.

Follow-up tests are recommended every 3 to 6 months for 2 years, and then once every 6 to 12 months. A medical history and physical exam can help to find signs and symptoms of recurrent pancreatic cancer early. CA 19-9 is a substance found in blood and high levels can be caused by pancreatic cancer. Thus, a CA 19-9 blood test is recommended as part of follow-up testing. A CT scan of the abdomen with contrast is also recommended to look for early signs of cancer recurrence.

Next steps

After completing adjuvant treatment, if follow-up tests show a recurrence, see Guide 8 for treatment recommendations. If you didn't have adjuvant treatment because tests after surgery found metastases, you can see Guide 12 for treatment options.

Guide 8. Treatment for recurrence after surgery



Guide 8 shows the tests and treatments that are recommended when there is a return (recurrence) of pancreatic cancer after surgery and adjuvant treatment.

Tests and results

First, you may have a biopsy to confirm recurrence of pancreatic cancer. Based on tests, your doctors will know how far the cancer has spread. Cancer that came back in or near the pancreas is called a local or locoregional recurrence. Cancer that has spread to sites far away from the pancreas is called metastatic cancer.

Treatment

For pancreatic cancer recurrence, joining a clinical trial is always the preferred treatment choice. Best supportive care without active cancer treatment should also be considered, especially for patients with a poor health status. Your health status, also called performance status, is a rating by your doctor based on your overall health, cancer symptoms, and ability to do daily activities. Supportive care, also called palliative care, is treatment to relieve the symptoms of cancer and side effects of cancer treatment. The other recommended treatments for a recurrence depend on how far the cancer has spread.

For a local recurrence, there are other treatment options. One option is to receive radiation, with or without chemotherapy, if you haven't had it before. Another option is to receive a different chemotherapy than you had before.

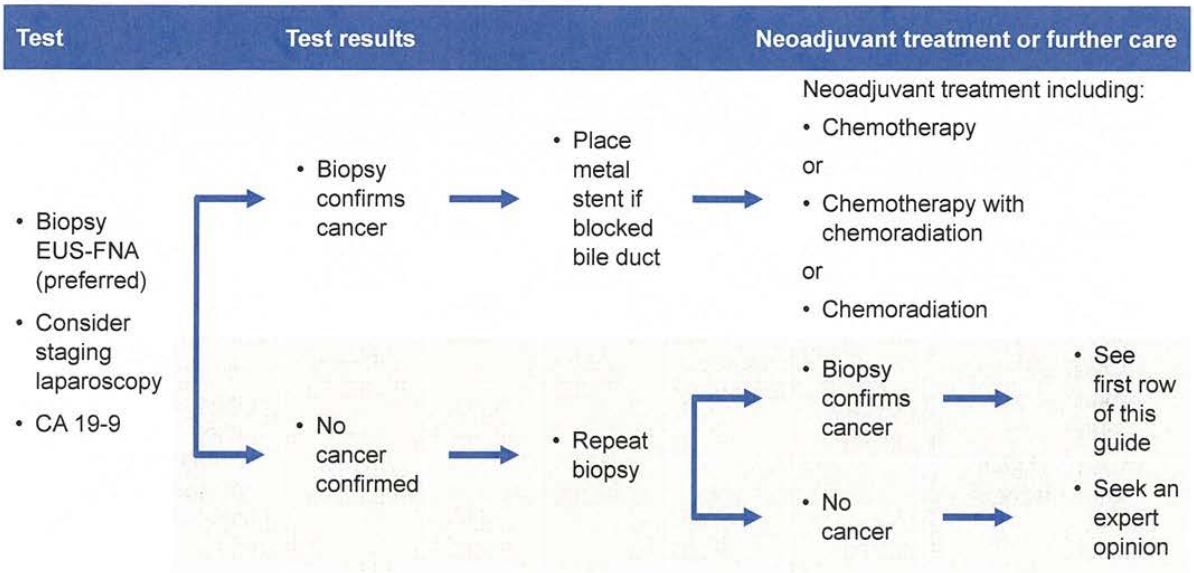
For metastatic cancer, treatment primarily consists of chemotherapy, with the specific options depend on how long it has been since your last treatment was completed. If the cancer recurrence is more than 6 months after completing primary treatment, then options include trying the same chemotherapy you had before or a different chemotherapy. If the recurrence is less than 6 months after completing primary treatment, then you should receive a different chemotherapy than before.

Borderline resectable pancreatic cancer

This section describes the tests and treatments recommended for borderline resectable pancreatic cancer. This is when cancer is confined to the pancreas but involves nearby blood vessels or structures to the extent that there is a risk that it might not be resectable with clear (negative) margins. A clear margin is when no cancer cells are found in the normal-looking tissue around the edge of the tumor removed during surgery.

Surgery should only be used as primary treatment if your doctors think all of the cancer can be completely removed at the time of the operation. Thus, if you have a borderline resectable pancreatic cancer, your doctor may plan to give you treatment before surgery to try to shrink the cancer in order to increase the chances that it can all be successfully removed. This is called neoadjuvant treatment. However, your doctor may also choose not to give neoadjuvant treatment and just plan to do surgery right away.

Guide 9. Planned neoadjuvant treatment



Guide 9 shows the recommended options for neoadjuvant treatment for borderline resectable pancreatic cancer. The goal of neoadjuvant treatment is to shrink the cancer so all of the cancer can be removed with surgery.

Tests

First, your doctor will remove a sample of the tumor to test for cancer cells. This is called a biopsy. There is more than one type of biopsy, but an EUS-FNA biopsy is preferred. Your doctor may also want to do a staging laparoscopy to make sure there are no metastases in your abdomen that didn't show up on other imaging tests. This is usually considered if you are at higher risk of having metastases. If the cancer is blocking a bile duct, then a stent will be placed to unblock it.

Test results and treatment

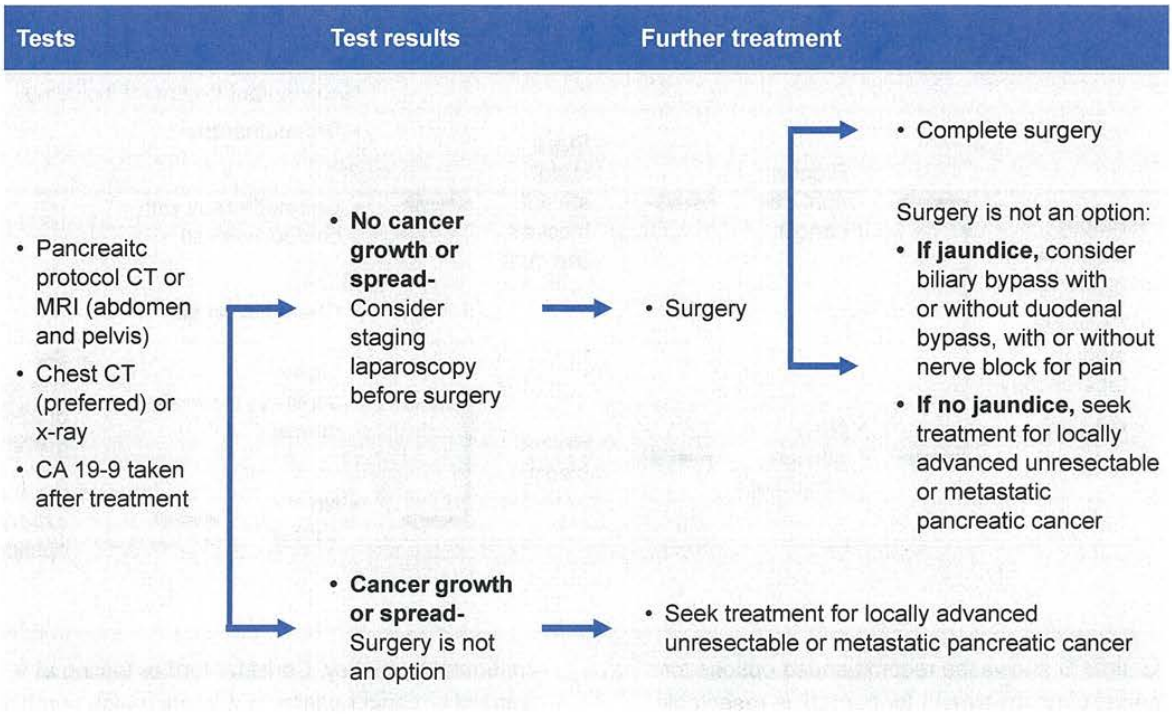
If the first biopsy doesn't confirm cancer, then a repeat biopsy must be done. Neoadjuvant treatment isn't recommended until a cancer diagnosis is confirmed by biopsy. Consider further testing at a hospital or cancer center that treats a high number of people with pancreatic cancer.

Once a biopsy confirms pancreatic cancer, then you will begin neoadjuvant treatment. There are 3 main treatment options to choose from: chemotherapy only, chemotherapy and chemoradiation, or chemoradiation alone. There is not enough evidence to recommend which of these approaches is best or which specific chemotherapy regimen to use for neoadjuvant treatment. Although, the regimens used for metastatic disease are commonly used for borderline resectable pancreatic cancer as well. Joining a clinical trial is encouraged.

Next steps

If you received neoadjuvant treatment, see Guide 10 for follow-up after neoadjuvant treatment. See Guide 11 for further treatment recommendations after neoadjuvant treatment.

Guide 10. Follow-up after neoadjuvant treatment



Guide 10 shows the follow-up tests and treatments recommended after completing neoadjuvant treatment for borderline resectable pancreatic cancer. Follow-up tests are given after treatment to check how well treatment worked and to make sure there has been no cancer growth or spread.

Tests

Repeat imaging tests such as a CT or MRI of your abdomen, pelvis, and chest are recommended. The most common test is a pancreatic protocol CT scan, similar to what was done prior to starting treatment. You may also have a staging laparoscopy.

Test results and primary treatment

If the follow-up tests don't show any signs of cancer growth or spread, then you will proceed with an operation to remove the tumor. There are 3 types of surgery for pancreatic cancer. Which type of surgery you will have depends on the size and location of the cancer in your pancreas. The types of surgery are listed in Part 3.

Surgery should be done 4 to 8 weeks after neoadjuvant treatment. Surgery can be done more than 8 weeks afterward, but if you received radiation, then radiation-induced fibrosis might make surgery more difficult. Hospitals that perform many pancreatic surgeries often have better results.

Results

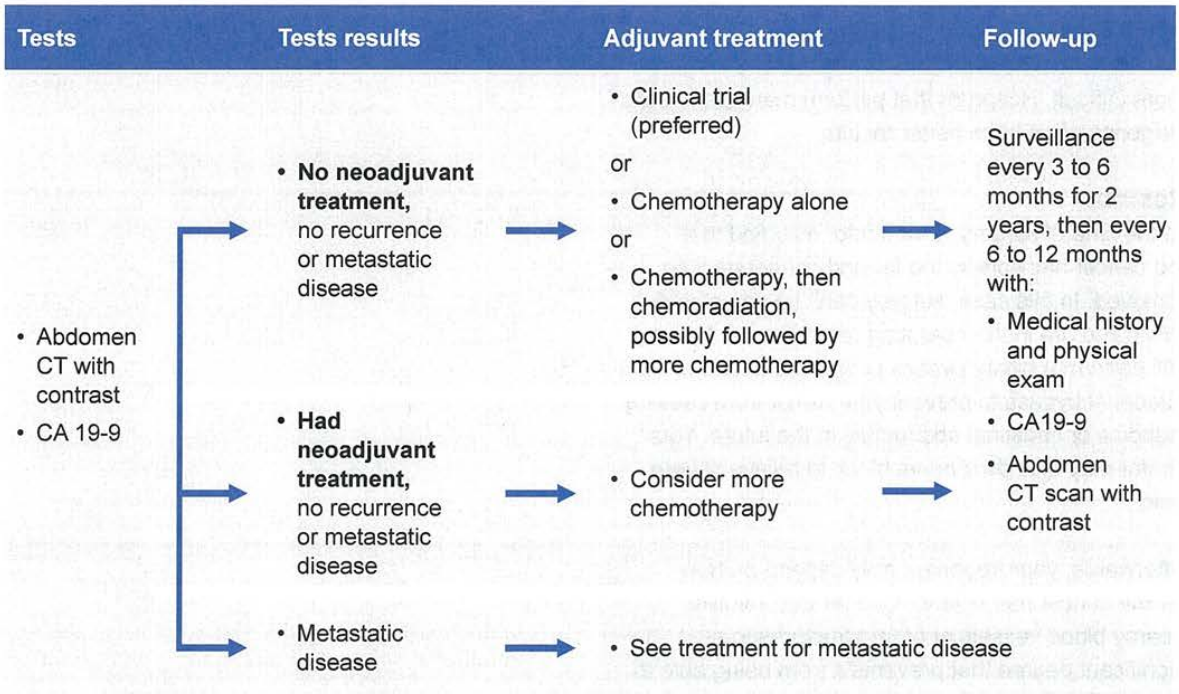
At the time of surgery, your doctor may find that the cancer has spread too far and cannot be fully removed. In this case, surgery can't be completed. While you are in the operating room, the doctor may still perform a biliary bypass procedure and/or a duodenal bypass to prevent your tumor from causing jaundice or intestinal obstruction in the future. Your doctor may also do a nerve block to relieve severe pain.

Afterwards, your treatment may depend on how far the cancer has spread. Cancer that involves nearby blood vessels or other structures to a significant degree that prevents it from being able to be completely removed by surgery is called locally advanced unresectable pancreatic cancer. Cancer that has spread outside the pancreas to distant sites in the body is called metastatic pancreatic cancer.

Next steps

If the cancer was removed by surgery, see Guide 11 for adjuvant treatment recommendations. If the cancer couldn't be removed by surgery, see treatment for locally advanced or metastatic pancreatic cancer.

Guide 11. Adjuvant treatment after surgery



Guide 11 shows the tests and treatments recommended after surgery for borderline resectable pancreatic cancer. This is referred to as adjuvant treatment, which refers to treatment given after surgical resection to try to kill any remaining cancer cells.

Tests

Before beginning adjuvant treatment, you will have a CT scan of the abdomen with contrast and CA 19-9 blood test. Contrast is a dye that is put into the body to make clearer pictures during imaging tests. These tests are done to check for signs of cancer that has returned, grown, or spread.

Test results

If the tests don't show any signs of recurrence or metastases, the next treatment recommendations depend on whether or not you had neoadjuvant treatment before surgery.

If you did not have neoadjuvant treatment, then you will be recommended to receive adjuvant treatment. Adjuvant treatment should only be started after you've fully recovered from surgery. Starting 4 to 8 weeks after surgery is ideal.

If you had neoadjuvant treatment, then your doctor may still want to give you adjuvant treatment, depending on what kind of and how much treatment you received before surgery, and what was found during the surgery.

Adjuvant treatment

There are 3 main options for adjuvant treatment:

- Joining a clinical trial is strongly recommended. A clinical trial is a type of research that studies the safety and effectiveness of a new treatment.
- Chemotherapy drug options include gemcitabine alone or in combination with capecitabine, 5-FU with leucovorin, continuous infusion 5-FU, or capecitabine alone.
- Chemotherapy plus chemoradiation. In this case, chemotherapy may be given entirely before chemoradiation, or sometimes both before and after chemoradiation.

Recommended chemotherapy drugs include gemcitabine alone or with capecitabine, 5-FU with leucovorin, continuous infusion 5-FU, or capecitabine alone. During radiation, chemotherapy may be added using fluoropyrimidine (preferred), such as continuous infusion 5-FU or capecitabine, or gemcitabine.

Follow-up

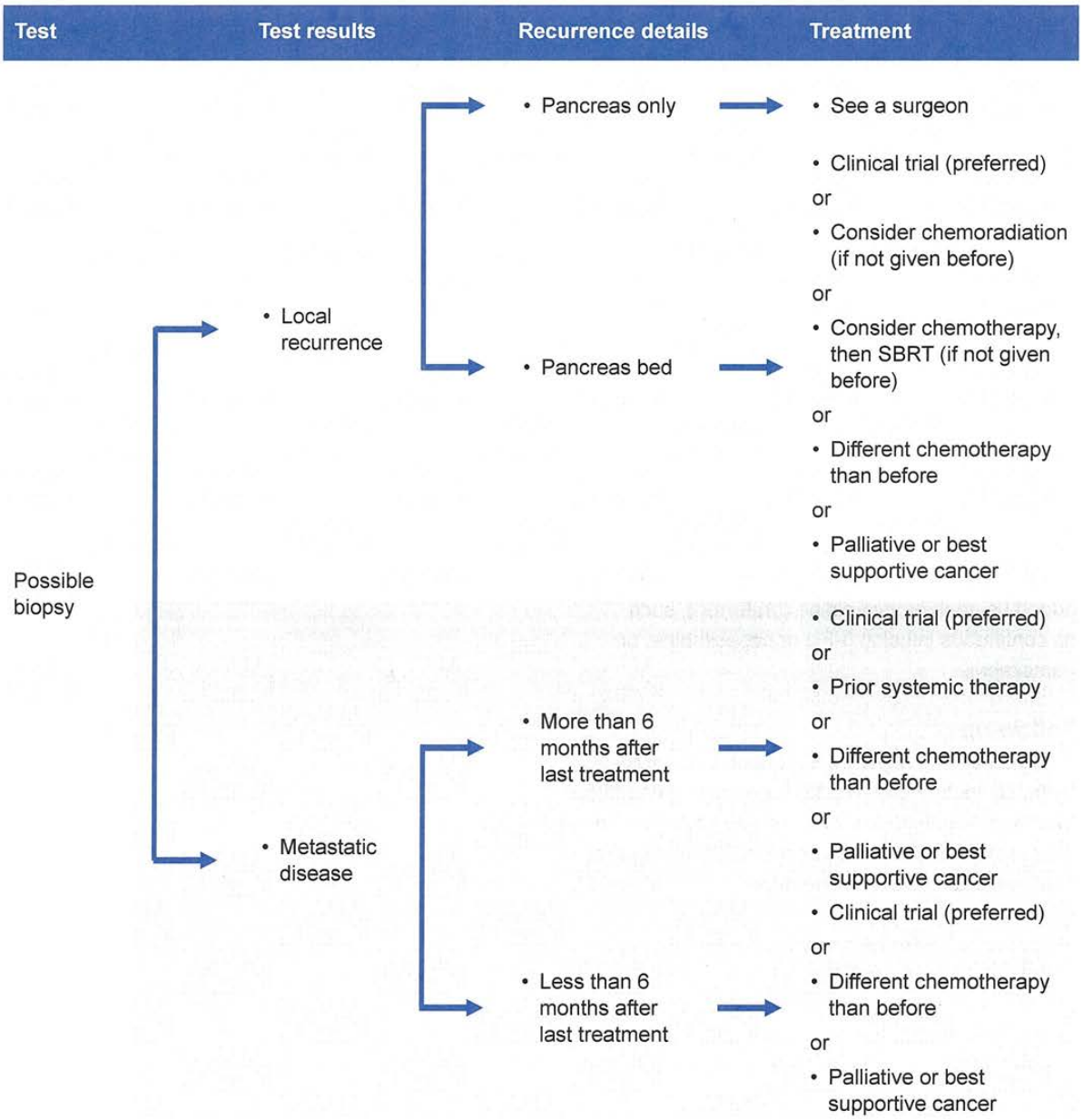
After completing adjuvant treatment, you will have follow-up tests. Follow-up tests are tests given after treatment to check how well treatment worked. These tests look for signs of cancer return (recurrence) or spread (metastasis) after treatment.

Follow-up tests are recommended every 3 to 6 months for 2 years, and then once every 6 to 12 months. A medical history and physical exam can help to find signs and symptoms of pancreatic cancer early. CA 19-9 is a substance found in blood and high levels can be caused by pancreatic cancer. Thus, a CA 19-9 blood test is recommended as part of follow-up testing. A CT scan of the abdomen with contrast is also recommended to look for early signs of cancer recurrence.

Next steps

After completing adjuvant treatment, if follow-up tests show a local recurrence or metastases, see Guide 12 for treatment recommendations.

Guide 12. Treatment for recurrence after surgery



Guide 12 shows the tests and treatments that are recommended when there is a return (recurrence) of cancer after surgery and adjuvant treatment.

Tests and results

First, you may have a biopsy to confirm pancreatic cancer if not done previously. A biopsy is the removal of a sample of tissue from your body to test for cancer cells. Additional imaging studies will allow your doctors to know how far the cancer has spread. Cancer that came back in or near the pancreas is called a local recurrence. Cancer that has spread to sites far away from the pancreas is called metastatic cancer.

Treatment

For pancreatic cancer recurrence, joining a clinical trial is always the preferred treatment choice above any other option. A clinical trial is a type of research that studies the safety and effectiveness of a test or treatment. Best supportive care without active cancer treatment should also be considered, especially for patients with a poor health status. Your health status, also called performance status, is a rating by your doctor based on your overall health, cancer symptoms, and ability to do daily activities.

Supportive care, also called palliative care, is treatment to relieve the symptoms of cancer and side effects of cancer treatment. See Part 4 for supportive care details.

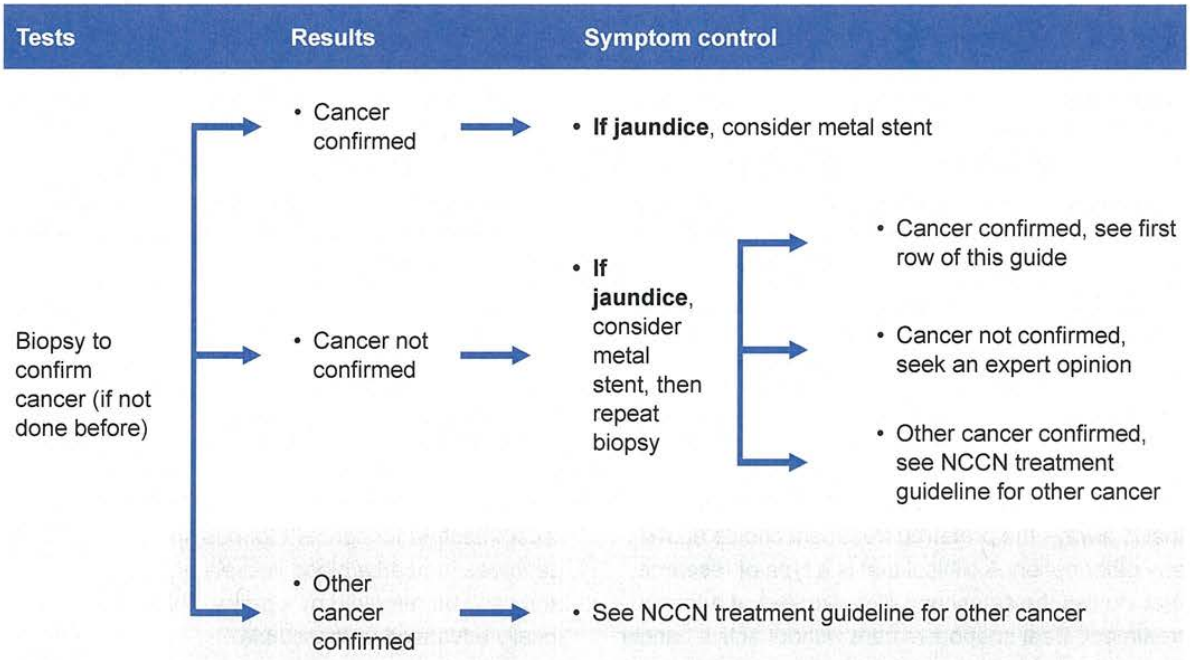
- For a local recurrence, there are two other treatment options. One option is to receive chemoradiation if you haven't had it before. The other option is to receive a different chemotherapy than you had before.
- For metastatic cancer, the other options depend on how long it has been since the last treatment was completed. If the cancer recurrence is more than 6 months after completing the last treatment, then options include the same chemotherapy you had before or a different chemotherapy. If the recurrence is less than 6 months after completing the last treatment, then the other option is to receive a different chemotherapy than before.

Locally advanced unresectable pancreatic cancer

This section describes the tests and treatments recommended for cancer that has spread outside the pancreas to nearby blood vessels or other tissues and can't be removed by surgery. This is called locally advanced unresectable.

- Cancer that can be removed by surgery is called resectable.
- Cancer that can't be removed by surgery is called unresectable.

Guide 13. Pretreatment tests and symptom control



Guide 13 shows the recommended pretreatment steps for locally advanced unresectable pancreatic cancer. The pretreatment process may include some tests and managing symptoms caused by the cancer.

Tests

Before beginning cancer treatment, a biopsy is recommended to confirm pancreatic cancer if not done previously. A biopsy is the removal of a sample of tissue from your body to test for cancer cells.

Results and symptom control

If a biopsy confirms pancreatic cancer, then the next step is to treat symptoms caused by the cancer. One common symptom is jaundice. This is a yellowing of the skin and eyes due to a buildup of bilirubin in the blood. Bilirubin is a yellow-brown substance in bile. It is a digestive fluid made in the liver.

A tumor can cause jaundice by blocking a duct that drains bile and bilirubin from the liver. If you have jaundice, then your doctors will place a stent in the bile duct (typically by ERCP) to relieve the blockage in your bile duct. You will often be given antibiotic drugs along with the stent, especially if you have signs of cholangitis (bile duct infection) such as fevers or chills. If you will have surgery for your pancreatic cancer in the very near future, placement of a bile duct stent may not be necessary. You may not need a stent if you had a biliary bypass during a previous surgery or laparoscopy.

If the first biopsy doesn't confirm pancreatic cancer, then the next step is to treat symptoms such as jaundice as described in the previous paragraph. However, when placing the biliary stent, your doctor may also take samples (called brushings) of the duct for testing. Then, at least two more biopsies should be done to try to confirm pancreatic cancer. There is more than one type of biopsy that can be used, but EUS-FNA with or without a core biopsy is preferred. A core biopsy would remove a larger sample of tissue with a wide, hollow needle to further test for cancer.

If another type of cancer is found on biopsy, you will seek treatment for that type of cancer. Your doctor may refer to the NCCN treatment guideline for the type of cancer confirmed on biopsy.

Next steps

After confirming pancreatic cancer with a biopsy and treating jaundice, see Guide 14 for first-line treatment recommendations.

Guide 14. First-line treatment

Performance status rating	First-line treatment	
Good performance status →	• Clinical trial (preferred) or • Chemotherapy or • Chemotherapy, followed by chemoradiation or SBRT (patients with locally advanced disease only) or • Chemoradiation or SBRT for patients who cannot get combination chemotherapy	→ • For good performance status and disease progression, see Guide 15
Poor performance status →	• Chemotherapy (one drug) or • Radiation for palliative care and/or • Other palliative and best supportive care	

Guide 14 shows the first-line treatment recommendations for locally advanced unresectable pancreatic cancer. First-line treatment is the first treatment or set of treatments given to control the cancer. First-line treatment options include a clinical trial, chemotherapy, chemoradiation, and supportive care.

Performance status rating

Which treatment is recommended for you depends on your health status rating, also called performance status. Your performance status is a rating by your doctor based on your overall health, cancer symptoms, and ability to do daily activities.

Good performance status means that your overall health is good and you're able to continue doing all of your regular daily activities very well. You also have very few or very mild symptoms of the cancer and you're able to eat well. Poor performance status means that your overall health is poor. You aren't able to do your regular daily activities well, and you are suffering from a number of cancer symptoms.

Your performance status rating is a very important factor when choosing the best treatment for you. This is because patients with a better performance status are able to tolerate treatments with higher risks of side effects. Your doctor should explain all of the risks and possible side effects of the treatments you receive.

First-line treatment

If you have a good performance status, then there are several first-line treatment options. The preferred option is to receive treatment within a clinical trial. A clinical trial is a type of research that studies the safety and effectiveness of a test or treatment. Your other options are chemotherapy drugs that have been tested in clinical trials.

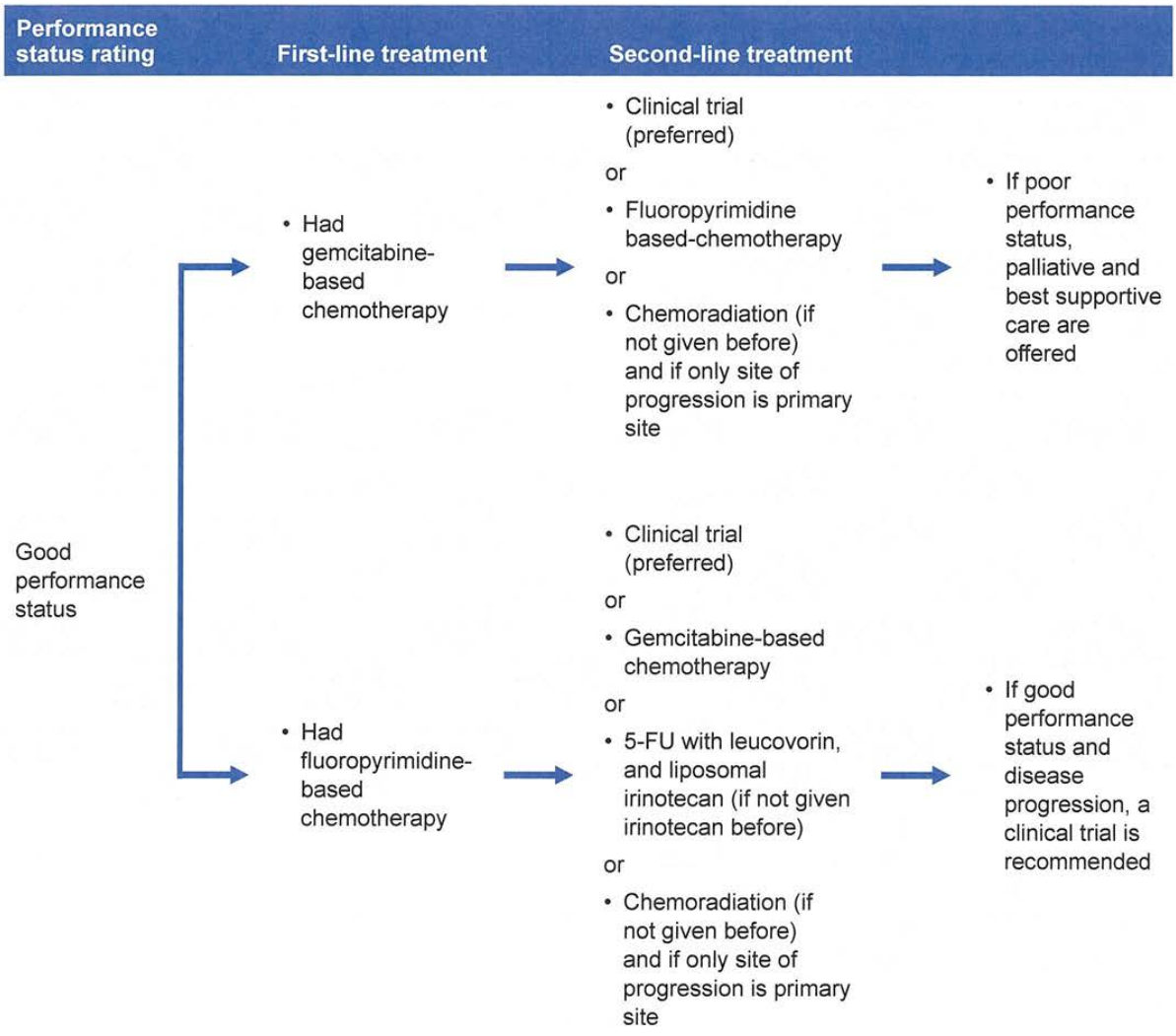
The other options include using various chemotherapy regimens such as: FOLFIRINOX (5-FU, leucovorin, irinotecan, and oxaliplatin), a GTX (gemcitabine, docetaxel, and capecitabine), FOLFOX (5-FU, leucovorin, and oxaliplatin), gemcitabine alone, capecitabine alone, continuous infusion 5-FU alone, or gemcitabine with nab-paclitaxel. Other options include a different gemcitabine-based combination regimen with capecitabine, cisplatin, or erlotinib. Following any of these chemotherapy options, you may receive chemoradiation or SBRT if there is no cancer growth for months and no signs of distant metastases.

If your peformance status is poor, there are two treatment options. One option is to receive one chemotherapy agent alone such as gemcitabine, capecitabine, or continuous 5-FU. The other option is to receive the best supportive care. Supportive care, also called palliative care, is a treatment focused on symptom control and improvement of quality of life. See Part 4 for more on supportive care.

Next steps

If first-line treatment doesn't stop cancer growth, see Guide 15 for second-line treatment recommendations. If the cancer spreads far from the first tumor, see the metastatic pancreatic cancer treatment recommendations.

Guide 15. Second-line treatment



Guide 15 shows the second-line treatment options recommended for locally advanced unresectable pancreatic cancer. Second-line treatment is the next set of treatments given when the first or previous treatments failed to stop cancer growth.

Performance status rating

Which treatment is recommended for you depends on your health status rating, also called performance status. Your performance status is a rating by your doctor based on your overall health, cancer symptoms, and ability to do daily activities. Good performance status means that your overall health is good and you're able to continue doing all of your regular daily activities very well. You also have very few or very mild symptoms of the cancer and you're able to eat well. Poor performance status means that your overall health is poor. You aren't able to do your regular daily activities well and your are suffering from a number of cancer symptoms.

Your performance status rating is a very important factor when choosing the best treatment for you. This is because patients with a better performance status are able to tolerate treatments with higher risks of side effects. Your doctor should explain all of the risks and possible side effects of the treatments you receive.

If you have a poor performance status after first-line treatment, then supportive care is recommended when the tumor continues to grow. If you have a good performance status after first-line treatment, then you may receive second-line treatment.

Second-line treatment

If you have a good performance status after first-line treatment, there are 4 main options for second-line treatment. The preferred option is to receive treatment within a clinical trial. The next two options depend on the type of chemotherapy you had before. Fluoropyrimidine-based chemotherapy is an option if you had a gemcitabine-based regimen before.

Likewise, gemcitabine-based therapy is an option if you had fluoropyrimidine-based regimen before. Lastly, chemoradiation is another possible option. Chemoradiation is only recommended if you haven't had it before and if cancer has only progressed in the pancreas, the primary site of the disease.

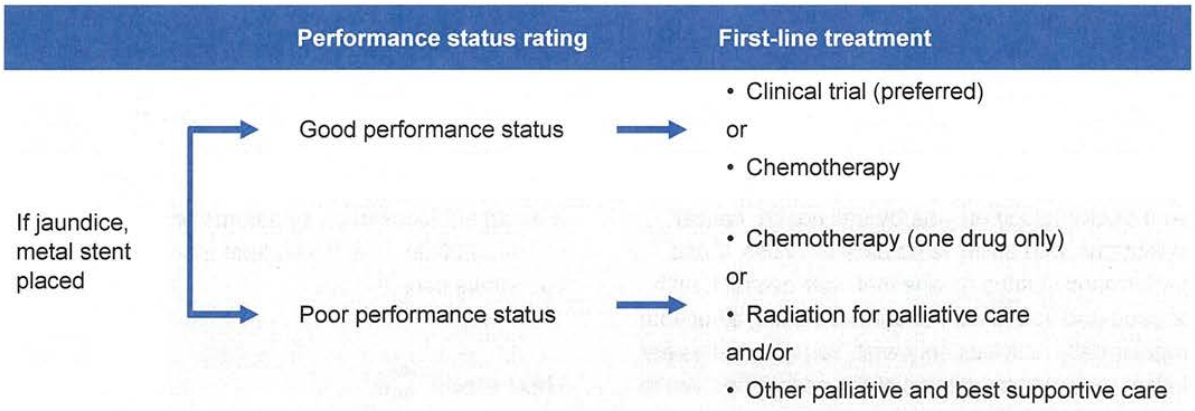
If you have a poor performance status after second-line treatment, then the next option is best supportive care. Supportive care, also called palliative care, is a treatment focused on symptoms and improvement of quality of life. See Part 4 from more information on supportive care.

Next steps

This next section describes the tests and treatments recommended for cancer that has spread outside the pancreas to other sites or organs in the body. This is called metastatic pancreatic cancer. Metastatic tumors are formed when cancer cells spread through the blood or lymphatic system to sites or organs that are far away from the pancreas.

Metastatic pancreatic cancer

Guide 16. First-line treatment



Guide 16 shows the first-line treatment options for metastatic pancreatic cancer. First-line treatment is the first treatment or set of treatments given to control the cancer. First-line treatment options include a clinical trial, chemotherapy, targeted therapy, and/or supportive care.

Symptom control

Before beginning treatment for the cancer, your doctor will first give treatment for symptoms such as jaundice. Jaundice is a yellowing of the skin and eyes caused by a buildup of bilirubin in the body. Bilirubin is a yellow-brown substance in bile. It is a digestive fluid made in the liver.

A tumor in the pancreas can cause jaundice by blocking the bile duct that drains bilirubin out of the liver. To relieve symptoms of jaundice, your doctors will place a stent in the bile duct (typically by ERCP) to relieve the blockage in your bile duct. You will often be given antibiotic drugs along with the stent, especially if you have signs of cholangitis (bile duct infection) such as fevers or chills.

You will not need a stent if you had a biliary bypass during a previous surgery or laparoscopy.

Performance status rating

Which first-line treatment option is recommended for you depends on your health status rating, also called performance status. Your performance status is a rating by your doctor based on your overall health, cancer symptoms, and ability to do daily activities. Good performance status means that your overall health is good and you're able to continue doing all of your regular daily activities very well. You also have very few or very mild symptoms of the cancer and you're able to eat well. Poor performance status means that your overall health is poor. You aren't able to do your regular daily activities well and you are suffering from a number of cancer symptoms.

Your performance status rating is a very important factor when choosing the best treatment for you. This is because patients with a better performance status are able to tolerate treatments with higher risks of side effects.

Certain treatments and drug combinations have a higher risk of severe, even lethal, side effects. Your doctor should explain all of the risks and possible side effects of the treatments you receive.

First-line treatment

If you have a good performance status, then several first-line treatment options may be considered. The preferred option is to receive treatment within a clinical trial. Your other options are chemotherapy drugs that have been tested in clinical trials.

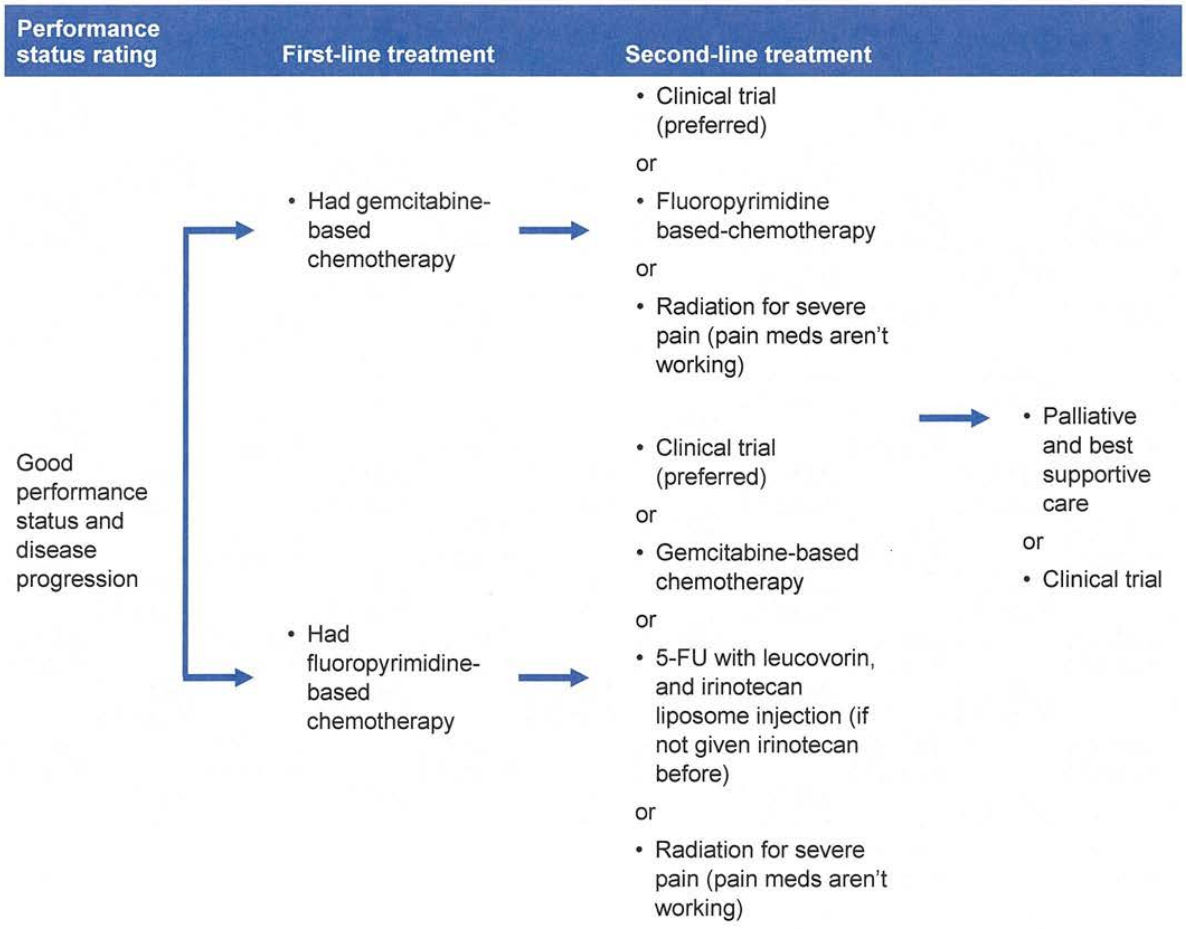
The other options include using various chemotherapy regimens such as: FOLFIRINOX (5-FU, leucovorin, irinotecan, and oxaliplatin), GTX (gemcitabine, docetaxel, and capecitabine), FOLFOX (5-FU with oxaliplatin), gemcitabine with nab-paclitaxel, or gemcitabine with erlotinib. Other options include gemcitabine alone, or a different gemcitabine-based combination regimen with capecitabine or cisplatin.

If your performance status is poor, there are two treatment options. One option is to receive treatment with single agent chemotherapy such as gemcitabine, capecitabine, or continuous 5-FU. The other option is to receive the best supportive care. Supportive care, also called palliative care, is a treatment focused on symptom control and improvement of quality of life. See Part 4 for more information on supportive care.

Next steps

If first-line treatment doesn't stop the cancer from growing, see Guide 17 for second-line treatment recommendations.

Guide 17. Second-line treatment



Guide 17 shows the second-line treatment options recommended for metastatic pancreatic cancer. Second-line treatment is the next set of treatments given when the first or previous treatments failed to stop cancer growth.

Performance status rating

Which treatment is recommended for you depends on your health status rating, also called performance status. Your performance status is a rating by your doctor based on your overall health, cancer symptoms, and ability to do daily activities. Your doctor will rate your performance status again after first-line treatment to decide which option is best to give you next.

Second-line treatment

If you have a good performance status after first-line treatment, there are 4 main options for second-line treatment. The preferred option is to receive treatment within a clinical trial. The next two options depend on the type of chemotherapy you had before. Fluoropyrimidine-based chemotherapy is an option if you had a gemcitabine-based regimen before. Likewise, gemcitabine-based therapy is an option if you had a fluoropyrimidine-based regimen before. Lastly, radiation therapy may be given if you have severe pain not helped by pain medications.

If second-line treatment doesn't stop the cancer from growing or spreading, then you have two more treatment options. One option is to receive the best supportive care. Supportive care, also called palliative care, is a treatment focused on symptom control and improvement of quality of life. The other option is to join a clinical trial.

If you have a poor performance status after first-line treatment, then best supportive care is recommended. See Part 4 for more information on supportive care.

Review

- Cancer tests are used to find cancer, plan treatment, and check how well treatment is working.
- When cancer is only in the pancreas, surgery may be a treatment option.
- If you have a borderline resectable pancreatic cancer, your doctor may plan to give you treatment before surgery. This is called neoadjuvant treatment.
- First-line treatment is the first treatment or set of treatments given to control the cancer.
- Second-line treatment is the next set of treatments given when the first or previous treatments failed to stop cancer growth.
- Before beginning treatment for the cancer, your doctor will first give treatment for symptoms such as jaundice.
- Your performance status rating is a very important factor when choosing the best treatment for you.

Notes

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Making treatment decisions

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While absorbing the fact that you have cancer, you must also learn about tests and treatments. And, the time you have to decide on a treatment plan may feel short. Parts 1 through 5 aimed to teach you about pancreatic cancer, its treatment, and other challenges. Part 6 may help you talk with your doctor and make treatment decisions that are right for you.

It's your choice

The role patients want in choosing their treatment differs. You may feel uneasy about making treatment decisions. This may be due to a high level of stress. It may be hard to hear or know what others are saying. Stress, pain, and drugs can limit your ability to make good decisions. You may feel uneasy because you don't know much about cancer. You've never heard the words used to describe cancer, tests, or treatments. Likewise, you may think that your judgment isn't any better than your doctors'.

Letting others decide which option is best may make you feel more at ease. However, whom do you want to make the decisions? You may rely on your doctors alone to make the right decisions. However, your doctors may not tell you which to choose if you have multiple good options. You can also have loved ones help. They can gather information, speak on your behalf, and share in decision-making with your doctors. Even if others decide which treatment you will receive, you still have to agree by signing a consent form.

On the other hand, you may want to take the lead or share in decision-making. In shared decision-making, you and your doctors share information, discuss the options, and agree on a treatment plan. Your doctors know the science behind your plan but you know your concerns and goals. By working together, you can decide on a plan that works best for you when it comes to your personal and health needs.

Questions to ask your doctors

You will likely meet with experts from different fields of medicine. It is helpful to talk with each person. Prepare questions before your visit and ask questions if the information isn't clear. You can also record your talks and get copies of your medical records. It may be helpful to have a family member or friend with you at these visits. A patient advocate or navigator might also be able to come. They can help you ask questions and remember what was said.

The questions on the next few pages are suggestions for information you read about in this book. Feel free to use these questions or come up with your own personal questions to ask your doctor and other members of your treatment team.

Questions to ask your doctors about testing

1. What tests will I have?
2. Do you recommend that I have a biopsy? If so, why?
3. Where will the tests take place? Will I have to go to the hospital?
4. How long will it take? Will I be awake?
5. Will it hurt? Will I need anesthesia?
6. What are the risks?
7. How do I prepare for testing? Should I bring someone with me?
8. How soon will I know the results and who will explain them to me?
9. After the biopsy, will I get a copy of the results?
10. Who will talk with me about the next steps? When?

Questions to ask your doctors about treatment

1. What are my treatment choices? What are their benefits and risks?
2. Is there a clinical trial that I can join?
3. Does this hospital or center offer the best treatment for me?
4. What can I do to prepare for treatment? Should I stop taking my medications? Should I store my blood in case I need a transfusion?
5. How many pancreatic cancer surgeries have you done? How many of your patients have had complications?
6. Is pancreatic cancer surgery a major part of your practice?
7. How soon should I start treatment? How long does treatment take?
8. How much will the treatment cost? Will my insurance cover the treatment?
9. What is the chance that my cancer will come back and/or spread?
10. Do I have time to get a 2nd opinion?

Questions to ask your doctors about side effects

1. What are the side effects of treatment?
2. When can they start?
3. How long will the side effects last?
4. When should I call the doctor about my side effects?
5. Are there any medications that can prevent or relieve these side effects?
6. Are there any complementary therapies that might help?
7. Are there any long-term effects from this treatment?

Questions to ask your doctors about clinical trials

1. What clinical trial is right for me?
2. How many people will be on the clinical trial?
3. What are the tests and treatments for this study? And how often will they be?
4. How long will I be on the clinical trial?
5. Will I be able to get other treatment if this doesn't work?
6. How will you know the treatment is working?
7. Who will help me understand the costs of the clinical trial?

Deciding between options

Deciding which option is best can be hard. Doctors from different fields of medicine may have different opinions on which option is best for you. This can be very confusing. Your spouse or partner may disagree with which option you want. This can be stressful. In some cases, one option hasn't been shown to work better than another, so science isn't helpful. Some ways to decide on treatment are discussed next.

Getting a 2nd opinion

Even if you like and trust your doctor, it is helpful to get a 2nd opinion. You will want to have another doctor review your test results. He or she can suggest a treatment plan or check the one you already heard about.

Things you can do to prepare:

- Check with your insurance company about its rules on 2nd opinions. You want to know about out-of-pocket costs for doctors who are not part of your insurance plan.
- Make plans to have copies of all your records sent to the doctor you will see for your 2nd opinion. Do this well before your appointment. If you run into trouble having records sent, pick them up and bring them with you.

If the new doctor offers other advice, make an appointment with your first doctor to talk about the differences. If you're not sure what to do, get a 3rd or 4th opinion. Do whatever you need to feel confident about your diagnosis and treatment plan.

Getting support

Support groups often include people at different stages of treatment. Some may be in the process of deciding while others may be finished with treatment. At support groups, you can ask questions and hear about the experiences of other people with pancreatic cancer. If your hospital or community doesn't have support groups for people with pancreatic cancer, check out the websites on the next page.

You can also reach out to a social worker or psychologist. They can help you find ways to cope or refer you to support services. These services may also be available to your family, friends, and those with children, so they can connect and get support.

Websites

American Cancer Society
cancer.org/cancer/pancreatic-cancer.html

Lustgarten Foundation for Pancreatic Cancer Research
lustgarten.org

National Cancer Institute
cancer.gov/types/pancreatic

National Coalition for Cancer Survivorship
canceradvocacy.org/toolbox/

NCCN Find a clinical trial
nccn.org/patients/resources/clinical_trials/find_trials.aspx

NCCN Guidelines for Patients®
nccn.org/patients

Pancreatic Cancer Action Network
pancan.org

Review

- A treatment plan can help you through treatment and beyond.
- You can choose how active a role to have in planning your treatment.
- You may wish to get a 2nd opinion on your treatment plan.
- Shared decision-making is a process in which you and your doctors plan treatment together.

Glossary

70 Dictionary

75 Acronyms

Dictionary

abdomen
The belly area between the chest and pelvis.

adjuvant treatment
Treatment given after the main treatment used to rid the body of cancer.

bile
Yellowish-brown fluid made by the liver to help digest food.

bile duct
A tiny tube or vessel in the body that drains digestive fluid (bile) from the liver.

biliary bypass
Surgery to re-route the flow of bile, digestive fluid, from the common bile duct into the small intestine.

biliary stent
A small, plastic or metal tube-shaped device used to unblock a bile duct.

bilirubin
A yellow-brown substance that is removed from blood by the liver and is part of bile.

biopsy
Removal of a small amount of tissue from the body to be tested for disease.

blood chemistry test
A test that measures the amount of certain substances in the blood to check for signs of disease.

blood vessel
A tube that blood circulates through in the body.

borderline resectable
Cancer that is confined to the pancreas but approaches nearby structures or has severe symptoms, raising concern that it might or might not be possible to remove all the cancer with surgery.

bypass
Surgery to re-route the flow of fluid in the body.

CA 19-9
Proteins made by cancer cells and found in blood.

cancer stage
A rating or description of the growth and spread of cancer in the body.

cells
The "building blocks" of tissues in the body.

chemoradiation
Treatment that combines chemotherapy and radiation therapy.

chemotherapy
Drugs that kill fast-growing cells throughout the body, including cancer cells and normal cells.

chemotherapy cycle
Days of treatment followed by days of rest.

cholangitis
An infection of the bile ducts that drain digestive fluids out of the liver.

clinical trial
Research on a test or treatment to assess its safety or how well it works.

combination regimen
The use of two or more drugs.

common bile duct
A tiny tube that carries digestive fluid (bile) from the liver into the small intestine, which absorbs nutrients from eaten food.

complementary medicine
Treatment that is given along with standard treatment but is not considered standard treatment.

complete blood count
A test of the number of blood cells.

computed tomography (CT)
A test that uses x-rays from many angles to make a picture of the inside of the body.

contrast
A dye put into your body to make clearer pictures during imaging tests.

Dictionary

CT-guided FNA biopsy
Use of pictures from a CT (computed tomography) scan to guide a thin needle to the right spot to remove a sample of tissue from the body for testing.

diabetes
A disease that causes high levels of sugar (glucose) in the blood.

diagnose
To identify a disease.

distal pancreatectomy
Surgery that removes the widest part (body) and narrow end (tail) of the pancreas as well as other nearby organs.

distant metastasis
Cancer cells that have spread from the first tumor to a distant (far away) part of the body.

duct
A small tube or vessel in the body that fluids pass through.

ductal adenocarcinoma
Cancer of the cells that line the pancreatic ducts, small tubes that fluids pass through, and make proteins that digest food.

duodenal bypass
Surgery to re-route the path that eaten food takes from the stomach to the small intestine, which absorbs nutrients from food.

duodenum
The first part of the small intestine, which absorbs nutrients from eaten food.

endocrine cells
Cells that make hormones, chemicals that activate cells or organs.

endoscopic retrograde cholangiopancreatography (ERCP)
A test that uses x-rays and a thin, lighted tube that is inserted into the body to see the pancreatic ducts and bile ducts.

endoscope
A thin, long tube with a light and camera lens at the end that is inserted through the mouth to take pictures of the inside of the body.

endoscopic ultrasound (EUS)
A test that uses a thin, lighted tube guided through the mouth and down the throat to take pictures of the inside of the body using sound waves.

enzymes
Proteins that help to digest food.

EUS-guided FNA biopsy
Use of pictures from sound waves and a thin, lighted tube inserted through the mouth to guide a thin needle to the right spot to remove a sample of tissue from the body for testing. Also called EUS-FNA.

exocrine cells
Cells that make proteins that help to digest food.

external beam radiation therapy (EBRT)
Radiation therapy received from a machine outside the body.

fibrosis
The scarring of supportive fibers in tissue.

fine-needle aspiration (FNA)
Use of a thin needle to remove a small amount of tissue or fluid from the body to test for cancer cells.

first-line treatment
The first set of treatments given to treat a disease.

fluoropyrimidine-based therapy
A combination chemotherapy regimen in which the main drug used is 5-FU (5-fluorouracil).

FOLFIRINOX
A combination chemotherapy regimen that includes 5-FU, leucovorin, irinotecan, and oxaliplatin.

gallbladder
A small organ that holds digestive fluid from the liver.

gastroenterologist
A doctor who's an expert in diseases of the digestive system. This sytem contains organs that break down food for the body to use.

gemcitabine-based therapy
A combination chemotherapy regimen in which the main drug used is gemcitabine.

Dictionary

general anesthesia
A controlled loss of wakefulness from drugs.

gland
A group of cells or a small organ that makes fluids or chemicals that the body needs.

hives
Itchy, swollen, and red skin caused by an allergic reaction. The body is ridding itself of a foreign substance.

hormones
Chemicals in the body that activate cells or organs.

insulin
A chemical that controls the amount of sugar in the blood.

intensity-modulated radiation therapy (IMRT)
Radiation therapy that uses small beams of different strengths based on the thickness of the tissue.

jaundice
Yellowing of the skin and eyes due to a buildup of bilirubin in the body.

laparoscopy
A surgical test that uses a thin, lighted tube inserted through a small cut in the belly (abdomen) to see inside the belly area and possibly remove tissue for testing.

leucovorin
A drug that improves how well certain cancer drugs work.

liver
An organ that removes waste from the blood and makes bile.

liver function tests
Tests of the blood for chemicals made or process by the liver to see if the liver is working well.

local anesthesia
A controlled loss of feeling in a small area of the body caused by drugs.

locally advanced pancreatic cancer
Cancer that started in the pancreas and has grown into nearby blood vessels or tissues.

local metastasis
Cancer cells that have spread from the first tumor to a nearby site.

local pancreatic cancer
Cancer that started in and hasn't grown outside the pancreas.

local recurrence
Cancer that came back after treatment, but is only in or near the pancreas.

lymph
A clear fluid containing white blood cells.

lymph node
Small groups of special disease-fighting cells located throughout the body.

lymph vessel
Tube-shaped ducts that carry lymph throughout the body.

magnetic resonance cholangiopancreatography (MRCP)
A test that uses radio waves and powerful magnets to make very clear pictures of the pancreas and bile ducts.

magnetic resonance imaging (MRI)
A test that uses radio waves and powerful magnets to make pictures of the inside of the body showing the shape and function of body parts.

main pancreatic duct
A small tube in the body that drains digestive fluids from the pancreas into the first part of the small intestine (duodenum).

medical history
All health events and medications taken to date.

metastases
Cancer that has spread from the first tumor in the pancreas and formed tumors in other parts of the body. Plural for "metastasis."

metastasis
Cancer that has spread from the first tumor to another body part.

metastatic pancreatic cancer
A tumor that started in the pancreas and has spread to distant sites in the body.

metastatic recurrence
Cancer that came back after treatment and has spread to sites far away from the pancreas.

Dictionary

microscope
A tool that uses lenses to see things the eyes can't.

multidisciplinary
Includes a number of doctors and other health professionals who are experts in different areas of cancer care.

neoadjuvant treatment
The treatment given before the main treatment used to rid the body of cancer.

organ
A part of the body that performs a certain function.

palliative care
Treatment for the health conditions caused by pancreatic cancer or cancer treatment.

pancreas
An organ that makes fluids that help digest food and chemicals that control blood sugar.

pancreatic duct
A small tube in the pancreas that digestive fluids pass through.

pancreatic protocol CT
A CT scan that is done in a certain way so that all of the pictures focus specifically on the pancreas to clearly show the pancreas, nearby blood vessels, and very tiny tumors.

pancreatic protocol MRI
An MRI scan that is done in a certain way so that all of the pictures focus specifically on the pancreas to clearly show the pancreas, nearby blood vessels, and very tiny tumors.

pancreatoduodenectomy
Surgery to remove the widest part (head) of the pancreas and parts of other nearby organs. Also called Whipple procedure.

pathologist
A doctor who's an expert at testing cells and tissue for disease.

percutaneous endoscopic gastrostomy (PEG) tube
A tube inserted through a cut in the belly area (abdomen) and placed into the stomach to give food.

performance status
A rating of a person's symptoms and ability to do daily activities.

physical exam
A review of the body by a health expert for signs of disease.

primary treatment
The main treatment used to rid the body of cancer.

primary tumor
The first mass of cancer cells in the body.

psychologist
Professional who helps people cope with the psychological and emotional effects of dealing with cancer.

radiation therapy
The use of high-energy rays (radiation) to destroy cancer cells.

radiologist
A doctor who's an expert in reading imaging tests.

recurrence
The return of cancer after treatment.

registered dietician
Trained nutritional specialist who gives nutritional advice and helps with the dietary needs of cancer care.

resectable
Cancer that can be removed by surgery.

second-line treatment
The next treatment(s) given when the first or previous treatment failed.

sedative
A drug that helps a person to relax or go to sleep.

side effects
An unplanned or unwanted physical or emotional response to treatment.

small intestine
The digestive organ that absorbs nutrients from eaten food.

social worker
An expert in meeting social and emotional needs.

spleen
An organ to the left of the stomach that helps to protect the body against disease.

stent
A small, plastic or metal tube-shaped device used to unblock a duct.

Dictionary

stereotactic body radiation therapy
Radiation therapy given in larger doses to smaller areas over a few short sessions of treatment.

stomach
An organ that helps to digest food by mixing it with digestive juices to turn solid food into liquid.

superior mesenteric artery
The large, tube-shaped vessel that carries blood from the heart to the intestines—the organ food passes through after leaving the stomach.

superior mesenteric vein
The large, tube-shaped vessel that returns blood from the intestines—organ food passes through after leaving the stomach—back to the heart.

supportive care
Treatment for the symptoms or health conditions caused by cancer or cancer treatment.

surgery
An operation to remove or repair a part of the body.

surgical margin
The normal-looking tissue around the edge of the tumor removed during surgery.

targeted therapy
Treatment with drugs that specifically target cancer cells.

total pancreatectomy
Surgery to remove the entire pancreas and other nearby organs and tissues.

unresectable
Cancer that can't be removed by surgery.

U. S. Food and Drug Administration (FDA)
A federal government agency that regulates drugs and food.

Whipple procedure
Surgery to remove the head of the pancreas and parts of other nearby organs. Also called pancreatoduodenectomy.

Acronyms

NCCN®
National Comprehensive Cancer Network®

3D-CRT
three-dimensional conformal radiation therapy

5-FU
5-fluorouracil

CAM
complementary and alternative medicine

CT
computed tomography

EBRT
external beam radiation therapy

ECOG
Eastern Cooperative Oncology Group

ERCP
endoscopic retrograde cholangiopancreatography

EUS
endoscopic ultrasound

EUS-FNA
endoscopic ultrasound–guided fine-needle aspiration

FDA
U.S. Food and Drug Administration

FNA
fine-needle aspiration

FOLFIRINOX
folinic acid, 5-FU, irinotecan, and oxaliplatin

FOLFOX
5-FU, leucovorin, and oxaliplatin

GTX
gemcitabine, docetaxel, and capecitabine

IMRT
intensity-modulated radiation therapy

MRCP
magnetic resonance cholangiopancreatography

MRI
magnetic resonance imaging

PEG
percutaneous endoscopic gastrostomy

PS
performance status

SBRT
stereotactic body radiation therapy

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800.641.2422 • UH Seidman Cancer Center
uhhospitals.org/seidman
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my.clevelandclinic.org/services/cancer
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mayoclinic.org/departments-centers/mayo-clinic-cancer-center

Memorial Sloan Kettering
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New York, New York
800.525.2225
mskcc.org

Moffitt Cancer Center
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moffitt.org

The Ohio State University
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James Cancer Hospital and
Solove Research Institute
Columbus, Ohio
800.293.5066
cancer.osu.edu

Roswell Park Cancer Institute
Buffalo, New York
877.275.7724
roswellpark.org

Siteman Cancer Center at Barnes-
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University School of Medicine
St. Louis, Missouri
800.600.3606
siteman.wustl.edu

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Pancreatic Cancer

Version 1.2017

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